

EVALUATING OCCUPANCY RATES AND SPECIES RICHNESS OF
GUILDS ACROSS THE ATLANTIC RIM NATURAL RESOURCE
PROJECT AREA, WYOMING (2010 – 2016)

February 2018

Nicholas J. Van Lanen, David C. Pavlacky Jr., and Adam W. Green



Bird Conservancy of the Rockies
14500 Lark Bunting Lane
Brighton, CO 80603
303.659.4348
www.birdconservancy.org
Tech. Report: SC-ARIM-03

The Bird Conservancy of the Rockies

Connecting people, birds and land

Mission: Conserving birds and their habitats through science, education and land stewardship

Vision: Native bird populations are sustained in healthy ecosystems

Bird Conservancy of the Rockies conserves birds and their habitats through an integrated approach of science, education and land stewardship. Our work radiates from the Rockies to the Great Plains, Mexico and beyond. Our mission is advanced through sound science, achieved through empowering people, realized through stewardship and sustained through partnerships. Together, we are improving native bird populations, the land and the lives of people.

Core Values:

1. **Science** provides the foundation for effective bird conservation.
2. **Education** is critical to the success of bird conservation.
3. **Stewardship** of birds and their habitats is a shared responsibility.

Goals

1. Guide conservation action where it is needed most by conducting scientifically rigorous monitoring and research on birds and their habitats within the context of their full annual cycle.
2. Inspire conservation action in people by developing relationships through community outreach and science-based, experiential education programs.
3. Contribute to bird population viability and help sustain working lands by partnering with landowners and managers to enhance wildlife habitat.
4. Promote conservation and inform land management decisions by disseminating scientific knowledge and developing tools and recommendations.

Suggested Citation:

Van Lanen, N. J., D. C. Pavlacky Jr. and A. W. Green. 2018. Evaluating occupancy rates and species richness of guilds across the Atlantic Rim Natural Resource Project Area, Wyoming (2010 – 2016). Bird Conservancy of the Rockies. Brighton, Colorado, USA.

Contact Information:

Nick Van Lanen nick.vanlanen@birdconservancy.org

Bird Conservancy of the Rockies
14500 Lark Bunting Lane
Brighton, CO 80603
(303) 659-4348

EXECUTIVE SUMMARY

The Atlantic Rim project area, contained within the Rawlins Bureau of Land Management (BLM) Field Office jurisdiction, has undergone substantial road and well-pad development for oil and gas resource extraction beginning in 2007. To ensure proper management under the multi-use mandate, the BLM-funded avian monitoring effort began in 2010 to assess potential impacts of resource extraction and development on the sagebrush community; particularly Brewer's sparrow (*Spizella breweri*), sagebrush sparrow (*Artemisiospiza nevadensis*), sage thrasher (*Oreoscoptes montanus*), and green-tailed towhee (*Pipilo chlorurus*). We evaluated differences in site occupancy rates over time for these species and the greater sage-grouse (*Centrocercus urophasianus*) within the Atlantic Rim project area and BLM reference areas within the Wyoming-portion of Bird Conservation Region 10. We analyzed data collected using methods consistent with the Integrated Monitoring in Bird Conservation Regions (IMBCR) program from 2010 to 2016. We employed a Bayesian multi-species occupancy approach to determine significant differences in occupancy and richness trends. We observed moderate support for diminished occupancy trends in the high development region compared to the low development region of the Atlantic Rim project area for greater sage-grouse at both the large and small-scales investigated. Additionally, we observed a diminished trend in occupancy rates for the sage thrasher and sagebrush sparrow in the high development project area compared to the BLM reference sites within the Wyoming portion of Bird Conservation Region 10. Diminished trends in occupancy for these species in the high-development region of the Atlantic Rim may most likely be explained by the loss in total sagebrush cover and fragmentation of habitat resulting from resource extraction activities. We did not observe occupancy trends across the areas investigated for the green-tailed towhee or Brewer's sparrow. Our results were not of sufficient magnitude and/or statistical power for any of the performance thresholds to be reached. Additionally, we did not observe temporal trends in species richness across the regions investigated for generalist, grassland, riparian, sagebrush, shrubland, or woodland avian guilds. We estimated species richness within both low and high development regions of the Atlantic Rim to be significantly higher than across the BLM reference area throughout the Wyoming portion of Bird Conservation Region 10, indicating the Atlantic Rim project area represents important migratory songbird habitat for a wide suite of species compared to similar habitats in relatively close geographic proximity.

ACKNOWLEDGEMENTS

Stratification and allocation of survey effort were determined in collaboration with the USDI Bureau of Land Management (BLM). Many individuals helped make the 2010 - 2016 field seasons successful. We thank Frank Blomquist of the Bureau of Land Management – Rawlins Field Office for obtaining funds to conduct this research. We thank the Bird Conservancy’s IT personnel for managing the database and developing an online mapping tool allowed for easier planning of field crew schedules and navigation to survey sites. The Bird Conservancy’s landowner liaison, Jenny Berven, contacted county assessors to determine land ownership of survey locations and determined road densities within the Atlantic Rim study area with ArcGIS. We also thank the numerous field technicians who collected point count data throughout the study period. We are especially appreciative of the numerous private landowners that granted permission to survey on their lands. Finally, this report benefited greatly from review by Bird Conservancy staff and Atlantic Rim Working Group members.

TABLE OF CONTENTS

INTRODUCTION	15
STUDY AREA	16
METHODS	16
Sampling frame	16
Field methods	17
Statistical model	17
RESULTS	19
Greater sage-grouse	19
Sage thrasher	24
Green-tailed towhee	25
Brewer’s sparrow	27
Sagebrush sparrow	29
Species richness	30
Sagebrush obligates	30
Shrubland species	31
Generalist species	32
Grassland species	32
Riparian species	33
Woodland species	33
DISCUSSION	34
LITERATURE CITED	37
APPENDIX A	39

APPENDIX B	124
APPENDIX C	209
APPENDIX D	212

TABLE OF TABLES

Table 1. Mean parameter estimates for the intercept (b_0) and annual trend (β_1), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_1 0)$] for large-scale occupancy of sagebrush obligate species within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.....	20
Table 2. Mean parameter estimates for the intercept (d_0) and annual trend (β_2), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_2 0)$] for small-scale occupancy of sagebrush obligate species within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.....	20
Table 3. The probabilities of a diminished trend in large – scale β_2 and small-scale β_1 occupancy between the high development area and the low development area of the Atlantic Rim Natural Gas Development Project Area (ARIM) ($P HI < LO$) and between the ARIM high development area and the Bureau of Land Management (BLM) reference area ($P HI < BLM$), Wyoming, 2010 – 2016.	21
Table 4. The change in large-scale occupancy (Δ), Standard Error (SE) of the change in occupancy, probability the change in occupancy is < -0.1 ($P \Delta < -0.1$), probability the change in occupancy in the high development stratum is 2% smaller than the low development stratum ($P HI < LOW - 0.02$), and probability the change in occupancy in the high development stratum is 2% smaller than the Bureau of Land Management (BLM) reference stratum ($P HI < BLM - 0.02$) by stratum and species, Atlantic Rim Natural Gas Development Project Area, Wyoming, 2010 – 2016.....	21
Table 5. The change in small-scale occupancy (δ), Standard Error (SE) of the change in occupancy, probability the change in occupancy is < -0.1 ($P \delta < -0.1$), probability the change in occupancy in the high development stratum is 2% smaller than the low development stratum ($P HI < LOW - 0.02$), and probability the change in occupancy in the high development stratum is 2% smaller than the Bureau of Land Management (BLM) reference stratum ($P HI < BLM - 0.02$) by stratum and species, Atlantic Rim Natural Gas Development Project Area, Wyoming, 2010 – 2016.....	22
Table 6. Mean parameter estimates for the annual trend (β_3), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_3 0)$] for large-scale richness of species guilds within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.....	31

TABLE OF FIGURES

Figure 1. Stratification and location of the Atlantic Rim Project Area near Rawlins, WY.	16
Figure 2. The large-scale occupancy of the greater sage-grouse in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management	

(BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	23
Figure 3. The small-scale occupancy of the greater sage-grouse in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	23
Figure 4. The detection of the greater sage-grouse by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.	23
Figure 5. The large-scale occupancy of the sage thrasher in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	24
Figure 6. The small-scale occupancy of the sage thrasher in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	25
Figure 7. The detection of the sage thrasher by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.	25
Figure 8. The large-scale occupancy of the green-tailed towhee in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	26
Figure 9. The small-scale occupancy of the green-tailed towhee in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	26
Figure 10. The detection of the green-tailed towhee by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.	27
Figure 11. The large-scale occupancy of the Brewer’s sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	28
Figure 12. The small-scale occupancy of the Brewer’s sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	28
Figure 13. The detection of the Brewer’s sparrow by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.	28

Figure 14. The large-scale occupancy of the sagebrush sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	29
Figure 15. The small-scale occupancy of the sagebrush sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.	30
Figure 16. The detection of the sagebrush sparrow by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.	30
Figure 17. The species richness of sagebrush obligates in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	31
Figure 18. The species richness of shrubland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	32
Figure 19. The species richness of generalist birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	32
Figure 20. The species richness of grassland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	33
Figure 21. The species richness of riparian birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	33
Figure 22. The species richness of woodland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.	34

INTRODUCTION

The apparent large-scale declines of avian populations and the loss, fragmentation, and degradation of native habitats highlight the need for extensive and rigorous landbird monitoring programs (Rich et al. 2004, US North American Bird Conservation Initiative Committee 2009). As natural areas are developed due to a continuously increasing demand for energy resources, it is imperative for land managers to better understand the impacts that subsequent landscape changes have on wildlife communities. Higher road densities to facilitate resource transportation may lead to an increase in non-native vegetation along the roads and may fragment habitats. Tall structures resulting from development provide prominent perches which may aid predators in locating prey and/or may dissuade prey species from residing in the area. Man-made structures may also provide nest locations that may otherwise be unavailable. Furthermore, noise associated with increased traffic volume, as well as the drilling and operation of oil and natural gas rigs, may interfere with aspects of avian communication that are vital to territory advertisement and attracting mates (Ingelfinger and Anderson 2004, Holloran 2005).

The Atlantic Rim project area, contained within the Rawlins Bureau of Land Management (BLM) Field Office jurisdiction, has undergone substantial road and well-pad development for oil and gas resource extraction beginning with the approval of the environmental impact statement in 2007. As stewards of public lands, the BLM is tasked with facilitating multiple use of these lands, including providing simultaneous resource extraction and viable wildlife habitat (BLM 2007). To ensure these two goals were compatible within the Atlantic Rim project area, the BLM funded avian monitoring efforts beginning in 2010 to assess potential impacts of resource extraction and development on the sagebrush community; Brewer's sparrow (*Spizella breweri*), sagebrush sparrow (*Artemisiospiza nevadensis*), sage thrasher (*Oreoscoptes montanus*), and green-tailed towhee (*Pipilo chlorurus*).

In order to provide local land managers with unbiased and reliable information regarding the effects of development on avian communities in southern Wyoming, Bird Conservancy of the Rockies (hereafter, Bird Conservancy) used a probabilistic sampling design based on the Integrated Monitoring in Bird Conservation Regions (IMBCR) design for this study (White et al. 2013, Pavlacky et al. 2017). Important properties of the IMBCR design that relate to this study are:

- All vegetation types are available for sampling.
- Strata are based on fixed attributes; this will allow us to relate changes in bird populations to changes on the landscape through time.
- Local population trends can be directly compared to regional trends.
- Coordination among partners can reduce the costs of monitoring per partner.

The objectives of the study were to estimate the 1) site occupancy and species richness of avian guilds and 2) annual trend in site occupancy from 2010 to 2016 in the low and high development strata of the Atlantic Rim Project Area and the BLM reference area. In addition, we investigated thresholds for the rates of change in site occupancy of sagebrush-dependent birds to evaluate performance criteria developed by the Atlantic Rim Shrub-Dependent Songbird Working Group (BLM 2013).

We evaluated hypotheses for the effects of the high development stratum on the site occupancy of species richness of birds over time compared to the low development stratum and BLM reference areas defined as BLM lands within the Wyoming-portion of the Northern Rockies Bird Conservation Region (BCR 10). If oil and gas development has a negative effect on the sagebrush bird community, we predicted 1) the magnitude of the trend for site occupancy would be lower in the high development stratum relative to the low development stratum and/or 2) the magnitude of the trend for site occupancy would be lower in the high development stratum compared to the BLM reference area. To investigate management thresholds for sagebrush-dependent bird species (BLM 2013), we determined the 3) probability site occupancy in the

high development stratum declined by greater than 10% from 2010 and 2011 to 2016, and 4) probability the decline in site occupancy in the high development stratum was 2% or more than declines in the low development or BLM reference strata. For non-priority species, we determined the 5) probability site occupancy in the high development stratum declined by greater than 25% from 2010 and 2011 to 2016, and 6) probability the decline in site occupancy in the high development stratum was 2% or more than declines in the low development or BLM reference strata.

STUDY AREA

The study area was defined by the Atlantic Rim Natural Gas Development Project (hereafter, “Atlantic Rim”) and was composed predominantly of sagebrush and semi-desert shrublands. The 1,093 km² study area was located south of Rawlins, WY between Highways 789 and 71 and bordered to the south by Highway 70. In addition, Atlantic Rim data were compared to data collected under the IMBCR design on BLM lands in Wyoming within BCR 10 (hereafter, “BCR10”).

METHODS

Sampling frame

The IMBCR program employs a nested, probabilistic sampling design in which desired areas of inference are delineated as strata (White et al. 2013, Pavlacky et al. 2017). IMBCR strata are nested within the intersection of BCRs and states and are delineated using fixed attributes, such as land ownership boundaries, elevation zones, major river systems, and wilderness/roadless designations. The IMBCR sampling frame consists of a uniform, 1-km² grid superimposed on each stratum. Grid cells are selected for sampling using generalized random-tesselation stratification (GRTS; Stevens and Olsen 2004). The potential IMBCR sampling frame includes private land, and the number of grids surveyed can vary by stratum and year depending on funding availability. However, the GRTS algorithm allows for a random, spatially-balanced sample even when permission to access private lands is denied and the number of sampled grids changes annually.

Bird Conservancy and its partners divided the Atlantic Rim study area into two separate strata based on different levels of proposed energy development (low and high-intensity; Figure 1) following the IMBCR design. These strata represent the area selected to make inferences about avian occupancy and species richness. The strata represent different levels of fragmentation/road densities within the Atlantic Rim study area with the High Development stratum (ARIM-HI) containing a slightly higher density of paved roadways and nearly twice the density of gravel roadways compared to the Low Development stratum (ARIM-LO) (Van Lanen

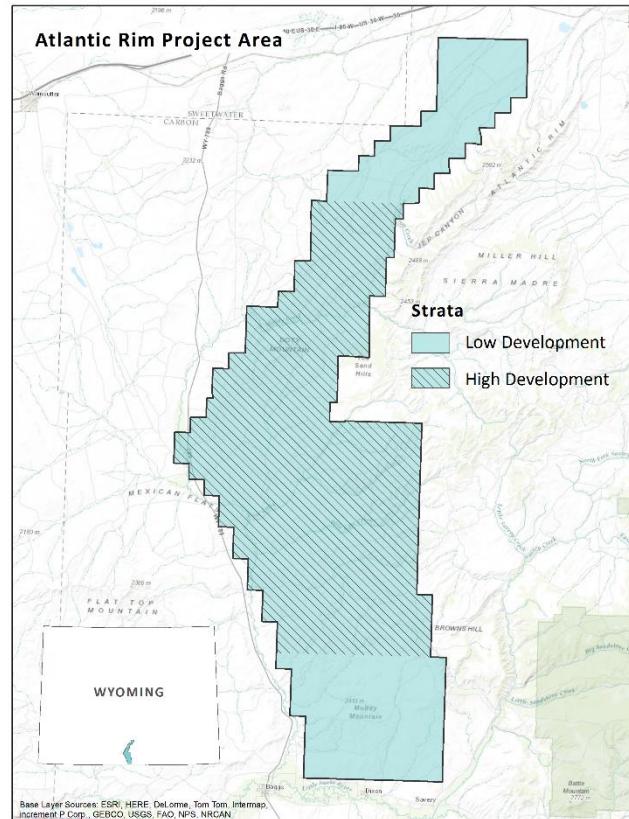


Figure 1. Stratification and location of the Atlantic Rim Project Area near Rawlins, WY.

et al. 2012). Additional data were collected on BLM lands within the Wyoming-portion of BCR10 through the IMBCR monitoring program (White et al. 2017) and used to compare Atlantic Rim species richness and occupancy to areas of similar habitat and management techniques.

Field methods

Each 1-km² grid cell selected for a survey contained 16 point count stations spaced 250 m apart. Trained observers attempted to visit all 16 point count stations within a grid cell in a single morning, beginning approximately 30 minutes before sunrise and ending no later than five hours after official sunrise. The exact seasonal timing of point count surveys was dependent upon elevation, latitude, and habitat of grid cells to ensure that surveys were conducted when individuals had returned to breeding grounds and were actively defending territories (i.e., singing). Observers conducted 6-minute avian point count surveys at each point using standard distance sampling protocols (Buckland et al. 2001). The initial detection of each individual or group of individuals of each species was recorded with the corresponding 1-minute interval within the count, and distance to the individual or group was determined using a laser range finder.

For more detailed information about survey methods, refer to the “IMBCR Field Protocol for Spatially Balanced Sampling of Landbird Populations” on the Rocky Mountain Avian Data Center website: <http://rmbo.org/v3/Portals/5/Protocols/2017%20Field%20Protocol%20for%20Spatially%20Balanced%20Sampling.pdf>.

We included IMBCR data collected from 2010 through 2016 across all Wyoming BLM field offices within BCR 10, representing a total of 465 grid cell visits and 6,195 individual point counts throughout the duration of the study. In addition, we also incorporated data from 2010 through 2016 collected within the ARIM-HI and ARIM-LO strata, including 92 grid cell visits representing 1,193 individual point counts within the ARIM-HI and 82 grid cell visits representing 937 individual point counts within the ARIM-LO stratum.

We truncated the avian data at 125 m, which resulted in 16 independent 4.9 ha point count plots within each grid cell. We pooled the 6 minute intervals of the point count duration into 3 2-minute time intervals and estimated detection probabilities using a removal design (MacKenzie et al. 2006, Pavlacky et al. 2012).

Statistical model

We extended the hierarchical Bayes multi-scale occupancy model of Mordecai et al. (2011) to accommodate multiple species (Royle and Dorazio 2008, Zipkin et al. 2009) and two spatial scales (Pavlacky et al. 2012). For each species, we estimated the probability of detection (p) in minute intervals given presence at point count plots and grid cells, probability of small-scale occupancy (θ) for point count plots given presence at the grid cells, and probability of large-scale occupancy (ψ) for grid cells (Pavlacky et al. 2012).

We used a series of logistic regression equations to model temporal trends for the large-scale (ψ) and small-scale (θ) occupancy of species in the three contrasts (i.e., ARIM-HI, ARIM-LO, and BLM) investigated, and to model year effects on the probability of detecting the species (p):

$$\begin{aligned} \text{logit}(\psi_{its}) &= b_{0is} + \beta_{1is}(t - 1) + \eta_{1its}, \\ \text{logit}(\theta_{its}) &= d_{0is} + \beta_{2is}(t - 1) + \eta_{2its}, \\ \text{logit}(p_{it}) &= a_{0it}, \end{aligned}$$

where b_{0is} is the intercept for the large-scale occupancy of species i and contrast s , d_{0is} is the intercept for the small-scale occupancy of species i and contrast s , and a_{0it} is the intercept for the detection of species i and year t . The parameters β_{1is} and β_{2is} are the annual trend parameters of species i and contrast s for large-scale and small-scale occupancy, respectively, and η_{1its} and η_{2its} are deviations around the trend of species i , year t and contrast s for large-scale and small-scale occupancy, respectively.

We estimated model parameters using Markov Chain Monte Carlo (MCMC) simulation implemented in JAGS 4.2.0 (Plummer 2003;2015) using the package R2jags in the R statistical computing environment (R Core Team 2017). We estimated the parameters using the mean and standard deviation of the MCMC samples of the posterior distributions, and calculated 95% credible intervals for the beta coefficients (β) for the trends in site occupancy using the quantiles of the posterior distributions.

We estimated species richness for six guilds composed of generalist, grassland, riparian, sagebrush, shrubland, or woodland species, including 96 observed species with at least one detection over the seven years of study (Zipkin et al. 2009). We derived estimates (Hobbs and Hooten 2015) of species richness, Ψ_{gts} , by summing the species occupancy estimates within each combination of guild g , year t , and contrast s . The estimates of species richness corresponds to the mean number of observed species among 1-km² grid cells for each guild, year, and contrast, and can be considered mean alpha species richness at the landscape scale (Whittaker et al. 2001). Using the MCMC samples from the posterior distributions, we derived estimates of the trends for species richness (β_{3gs}) by taking the mean of the trend parameters β_{1igs} for species i , guild g and contrast s .

To evaluate management thresholds, we estimated the change in small-scale (δ) and large-scale (Δ) occupancy by subtracting the mean of the trend estimates for years 2010 and 2011 from the trend estimate in year 2016. For sagebrush-dependent bird species, we calculated the posterior predictive distributions (Hobbs and Hooten 2015) to estimate the probability (P) of a >10% decline in occupancy between 2010–2011 and 2016 for small-scale [$P(\delta < -0.1)$] and large-scale [$P(\Delta < -0.1)$] occupancy. For all other species, we estimated the probability of a >25% decline in occupancy [$P(\delta < -0.25), P(\Delta < -0.25)$]. We calculated the probability small-scale (δ) and large-scale (Δ) occupancy in the high (HI) development stratum was >2% lower than site occupancy in the low (LO) development $\{P[\delta_{HI} < (\delta_{LO} - 0.02)], P[\Delta_{HI} < (\Delta_{LO} - 0.02)]\}$ and BLM reference $\{P[\delta_{HI} < (\delta_{BLM} - 0.02)], P[\Delta_{HI} < (\Delta_{BLM} - 0.02)]\}$ strata. In addition, we calculated the probability the trend in the high (HI) development stratum was less than those of the low (LO) development $[P(\beta_{HI} < \beta_{LO})]$ and BLM reference $[P(\beta_{HI} < \beta_{BLM})]$ strata, for the small-scale (β_1) and large-scale (β_2) trend parameters. We calculated posterior predictive distributions (Hobbs and Hooten 2015) to calculate the probability (P) trends were greater than $[P(\beta > 0)]$ or less than $[P(\beta < 0)]$ zero, for the small-scale (β_1) and large-scale (β_2) trend parameters. In addition, we used joint posterior predictive distributions (Hobbs and Hooten 2015) to evaluate potential interactions between the rates of change and trends in two contrasts. We considered $0.5 < P < 0.8$ as marginal evidence, $0.80 < P < 0.90$ as moderate evidence, and $P > 0.90$ as considerable evidence of a difference in regional trends.

RESULTS

We estimated small-scale (θ) and large-scale (ψ) occupancy, and annual trends in small-scale (β_1) and large-scale (β_2) occupancy between 2010 and 2016 for 96 species detected within the Atlantic Rim project area and on BLM reference lands within the BCR 10 portion of Wyoming. We provide detailed occupancy and trend results for five sagebrush-associated species of interest below. Annual large- and small-scale occupancy estimates for all 96 species analyzed are included in Appendices A and B. Additionally, we include the annual species richness estimates for all guilds investigated in Appendix C. For sagebrush-dependent bird species, we present the change in small-scale (δ) and large-scale (Δ) occupancy for the high development stratum, and the change in occupancy in the high development stratum relative to the reference strata in the text. None of the 91 non-priority species showed >25% declines in occupancy with a probability of 90% or greater ($P < 0.9$) in the high development stratum (Table S1, available as Supporting Information). However, declines in small-scale ($\delta = -0.11$, $SD = 0.14$) and large-scale ($\Delta = -0.10$, $SD = 0.09$) occupancy of the western meadowlark (*Sturnella neglecta*) were >2% in the high development stratum than the low development stratum ($P > 0.9$, Table S1). The small-scale occupancy of the black-headed grosbeak (*Pheucticus melanocephalus*) was stable in the high development stratum ($\delta = 0.00$, $SD = 0.06$) but estimated as 2% smaller than in the BLM reference stratum ($P > 0.9$, Table S1).

Greater sage-grouse

The large-scale occupancy of greater sage-grouse increased over time in the low development stratum ($P = 0.91$), but there was less evidence for temporal trends in the high development stratum and BLM reference area (both were $P < 0.56$, Table 1, Fig. 2). In terms of small-scale occupancy, we found moderate evidence for increasing trends of greater sage-grouse occupancy in the low development ($P = 0.83$) and BLM reference area ($P = 0.89$) regions and little evidence for a declining trend in the high development regions ($P = 0.67$, Table 2, Fig. 3).

The probability of a diminished trend in the high development stratum compared to the low development stratum indicates moderate evidence of a difference in large-scale occupancy ($P = 0.84$, Table 3, Fig. 2) and small-scale occupancy ($P = 0.83$, Table 3, Fig. 2). The probability of a reduced trend in the high development stratum compared to the BLM reference area did not support a difference in trends for large-scale occupancy ($P = 0.44$, Table 3, Fig. 1) and provided moderate evidence of a difference in trends for small-scale occupancy ($P = 0.87$, Table 3, Fig. 3).

The probability of detecting the greater sage-grouse did not vary by year and the mean detection probability across years was $\bar{p} = 0.56$ (Fig. 4).

In terms of management thresholds for the greater sage-grouse (Table 4, Table 5), there was little evidence for a >10% decline in large-scale ($\Delta = 0.02$; $SD = 0.15$; $P = 0.16$) and small-scale ($\delta = 0.00$; $SD = 0.02$; $P = 0.00$) occupancy for the high development stratum. There was moderate evidence the change in large-scale occupancy was 2% smaller in the high development stratum than the low development stratum ($P = 0.83$), and little evidence the change was 2% smaller in the high development stratum than the BLM reference stratum ($P = 0.37$). For small-scale occupancy, there was marginal evidence the change in occupancy was 2% smaller in the high development stratum than the low development stratum ($P = 0.53$), and moderate evidence the change was 2% smaller in the high development stratum than the BLM reference stratum ($P = 0.81$).

Table 1. Mean parameter estimates for the intercept (b_0) and annual trend (β_1), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_1|0)$] for large-scale occupancy of sagebrush obligate species within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.

	Intercept(b_0)				Trend(β_1)				$P(\beta_1 0)$
	Mean	SD	LCL	UCL	Mean	SD	LCL	UCL	
<i>High development</i>									
Greater sage-grouse	-1.089	1.474	-3.642	2.262	0.013	0.169	-0.321	0.346	0.538
Sage thrasher	1.018	0.461	0.115	1.940	-0.010	0.111	-0.232	0.204	0.543
Green-tailed towhee	0.659	0.455	-0.234	1.574	0.177	0.117	-0.046	0.411	0.937
Brewer's sparrow	3.069	0.743	1.735	4.644	0.146	0.154	-0.143	0.457	0.829
Sagebrush sparrow	-0.376	0.442	-1.264	0.490	-0.012	0.107	-0.224	0.201	0.547
<i>Low development</i>									
Greater sage-grouse	-1.234	1.624	-3.813	2.400	0.286	0.216	-0.121	0.728	0.914
Sage thrasher	-0.222	0.582	-1.378	0.917	0.040	0.135	-0.227	0.301	0.618
Green-tailed towhee	1.878	0.724	0.512	3.388	0.194	0.171	-0.132	0.538	0.878
Brewer's sparrow	2.831	0.870	1.251	4.649	0.211	0.189	-0.156	0.587	0.871
Sagebrush sparrow	-0.931	0.618	-2.153	0.273	-0.063	0.145	-0.353	0.219	0.661
<i>BLM reference area</i>									
Greater sage-grouse	-3.105	0.581	-4.243	-1.932	-0.015	0.106	-0.232	0.185	0.550
Sage thrasher	0.227	0.268	-0.300	0.755	0.072	0.069	-0.068	0.208	0.850
Green-tailed towhee	-0.806	0.276	-1.346	-0.265	0.039	0.070	-0.101	0.177	0.711
Brewer's sparrow	1.222	0.296	0.662	1.806	0.139	0.078	-0.010	0.299	0.967
Sagebrush sparrow	-0.196	0.267	-0.721	0.322	0.034	0.068	-0.101	0.171	0.691

Table 2. Mean parameter estimates for the intercept (d_0) and annual trend (β_2), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_2|0)$] for small-scale occupancy of sagebrush obligate species within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.

	Intercept(d_0)				Trend(β_2)				$P(\beta_2 0)$
	Mean	SD	LCL	UCL	Mean	SD	LCL	UCL	
<i>High development</i>									
Greater sage-grouse	-4.255	1.006	-6.222	-2.347	-0.063	0.153	-0.374	0.236	0.665

	Intercept(d_0)				Trend(β_2)				
	Mean	SD	LCL	UCL	Mean	SD	LCL	UCL	$P(\beta_2 0)$
Sage thrasher	-0.350	0.348	-1.092	0.304	-0.110	0.083	-0.274	0.059	0.906
Green-tailed towhee	-0.124	0.299	-0.735	0.440	0.080	0.075	-0.063	0.236	0.864
Brewer's sparrow	0.471	0.341	-0.202	1.118	0.061	0.082	-0.101	0.219	0.766
Sagebrush sparrow	-0.875	0.344	-1.538	-0.181	-0.020	0.083	-0.189	0.142	0.596
<i>Low development</i>									
Greater sage-grouse	-4.104	0.956	-5.981	-2.230	0.147	0.156	-0.159	0.455	0.828
Sage thrasher	-1.134	0.401	-1.971	-0.390	-0.022	0.095	-0.206	0.166	0.599
Green-tailed towhee	-0.025	0.363	-0.757	0.657	0.125	0.088	-0.044	0.301	0.917
Brewer's sparrow	0.450	0.375	-0.289	1.186	0.024	0.093	-0.164	0.197	0.613
Sagebrush sparrow	-1.324	0.472	-2.310	-0.428	0.052	0.107	-0.158	0.268	0.690
<i>BLM reference area</i>									
Greater sage-grouse	-2.836	0.619	-4.109	-1.680	0.167	0.136	-0.096	0.439	0.890
Sage thrasher	-0.813	0.292	-1.421	-0.252	0.067	0.081	-0.098	0.233	0.801
Green-tailed towhee	-0.565	0.304	-1.164	0.019	0.081	0.085	-0.083	0.250	0.826
Brewer's sparrow	-0.047	0.270	-0.575	0.468	0.138	0.077	-0.017	0.283	0.959
Sagebrush sparrow	0.062	0.262	-0.468	0.575	0.129	0.076	-0.019	0.281	0.955

Table 3. The probabilities of a diminished trend in large – scale(β_2) and small-scale (β_1) occupancy between the high development area and the low development area of the Atlantic Rim Natural Gas Development Project Area (ARIM) ($P|HI < LO$) and between the ARIM high development area and the Bureau of Land Management (BLM) reference area ($P|HI < BLM$), Wyoming, 2010 – 2016.

Species	Large-scale Occupancy		Small-scale Occupancy	
	$P HI < LO$	$P HI < BLM$	$P HI < LO$	$P HI < BLM$
Greater sage-grouse	0.845	0.444	0.832	0.875
Sage thrasher	0.611	0.735	0.761	0.93
Green-tailed towhee	0.529	0.156	0.645	0.499
Brewer's sparrow	0.611	0.493	0.387	0.751
Sagebrush sparrow	0.390	0.645	0.705	0.906

Table 4. The change in large-scale occupancy (Δ), Standard Error (SE) of the change in occupancy, probability the change in occupancy is < -0.1 ($P|\Delta < -0.1$), probability the change in occupancy in the high development stratum is 2% smaller than the low development stratum ($P|HI < LOW - 0.02$), and probability the change in occupancy in the high development stratum is 2% smaller than the Bureau of Land Management (BLM) reference stratum ($P|HI < BLM - 0.02$) by stratum and species, Atlantic Rim Natural Gas Development Project Area, Wyoming, 2010 – 2016.

Stratum Species	Δ	SD	$P \Delta < -0.1$	$P HI < LOW - 0.02$	$P HI < BLM - 0.02$
<i>High development</i>					
Greater sage-grouse	0.019	0.148	0.163	0.826	0.374
Sage thrasher	-0.011	0.120	0.224	0.577	0.713
Green-tailed towhee	0.167	0.110	0.007	0.215	0.160
Brewer's sparrow	0.025	0.033	0.000	0.430	0.810
Sagebrush sparrow	-0.015	0.136	0.271	0.366	0.604
<i>Low development</i>					

<i>Stratum</i> Species	Δ	SD	$P \Delta < -0.1$	$P HI < LOW - 0.02$	$P HI < BLM - 0.02$
Greater sage-grouse	0.275	0.211	0.032	0.826	0.374
Sage thrasher	0.051	0.174	0.195	0.577	0.713
Green-tailed towhee	0.084	0.084	0.006	0.215	0.160
Brewer's sparrow	0.042	0.049	0.001	0.430	0.810
Sagebrush sparrow	-0.065	0.145	0.385	0.366	0.604
<i>BLM reference</i>					
Greater sage-grouse	-0.004	0.028	0.006	0.826	0.374
Sage thrasher	0.092	0.088	0.019	0.577	0.713
Green-tailed towhee	0.048	0.085	0.041	0.215	0.160
Brewer's sparrow	0.102	0.057	0.001	0.430	0.810
Sagebrush sparrow	0.046	0.092	0.058	0.366	0.604
Greater sage-grouse	0.019	0.148	0.163	0.826	0.374

Table 5. The change in small-scale occupancy (δ), Standard Error (SE) of the change in occupancy, probability the change in occupancy is < -0.1 ($P|\delta < -0.1$), probability the change in occupancy in the high development stratum is 2% smaller than the low development stratum ($P|HI < LOW - 0.02$), and probability the change in occupancy in the high development stratum is 2% smaller than the Bureau of Land Management (BLM) reference stratum ($P|HI < BLM - 0.02$) by stratum and species, Atlantic Rim Natural Gas Development Project Area, Wyoming, 2010 – 2016.

<i>Stratum</i> Species	δ	SD	$P \delta < -0.1$	$P HI < LOW - 0.02$	$P HI < BLM - 0.02$
<i>High development</i>					
Greater sage-grouse	-0.002	0.023	0.002	0.534	0.806
Sage thrasher	-0.132	0.099	0.643	0.751	0.913
Green-tailed towhee	0.108	0.100	0.017	0.585	0.439
Brewer's sparrow	0.075	0.101	0.041	0.346	0.725
Sagebrush sparrow	-0.022	0.092	0.188	0.651	0.896
<i>Low development</i>					
Greater sage-grouse	0.020	0.030	0.004	0.534	0.806
Sage thrasher	-0.022	0.092	0.198	0.751	0.913
Green-tailed towhee	0.161	0.112	0.009	0.585	0.439
Brewer's sparrow	0.030	0.117	0.132	0.346	0.725
Sagebrush sparrow	0.050	0.106	0.078	0.651	0.896
<i>BLM reference</i>					
Greater sage-grouse	0.089	0.085	0.002	0.534	0.806
Sage thrasher	0.084	0.100	0.036	0.751	0.913
Green-tailed towhee	0.106	0.111	0.030	0.585	0.439
Brewer's sparrow	0.177	0.096	0.002	0.346	0.725
Sagebrush sparrow	0.163	0.094	0.003	0.651	0.896
Greater sage-grouse	-0.002	0.023	0.002	0.534	0.806

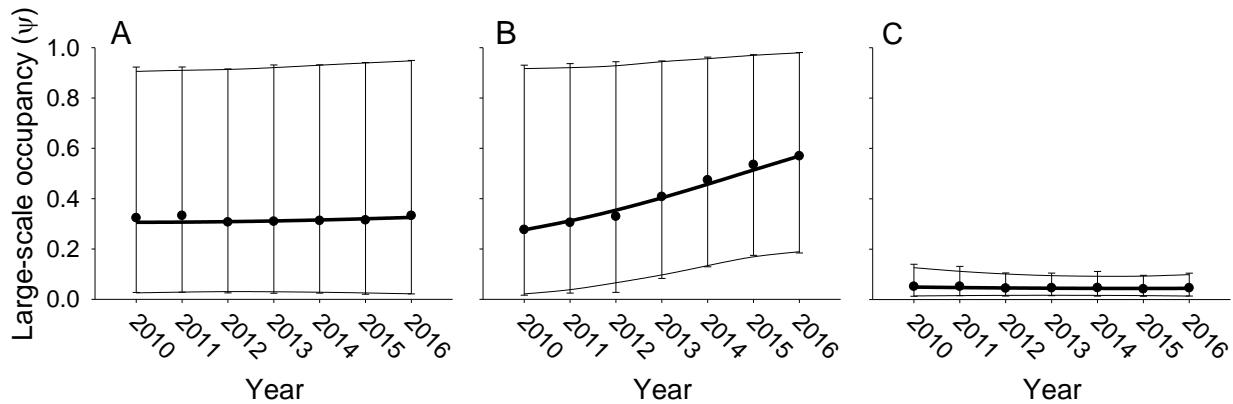


Figure 2. The large-scale occupancy of the greater sage-grouse in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

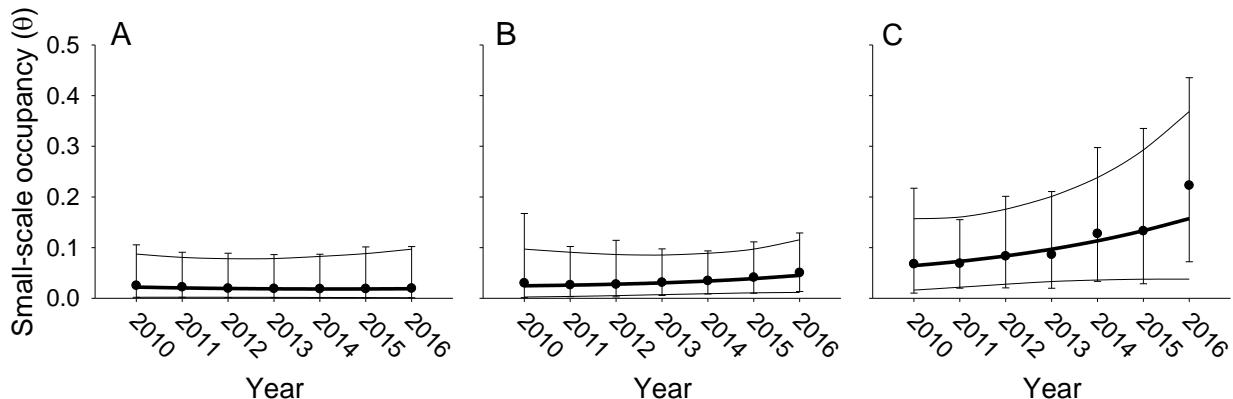


Figure 3. The small-scale occupancy of the greater sage-grouse in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

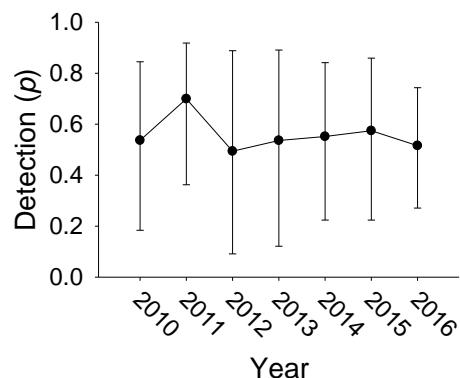


Figure 4. The detection of the greater sage-grouse by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.

Sage thrasher

We found little evidence for temporal trends in large-scale occupancy of the sage thrasher in the high development ($P = 0.54$) and low development regions ($P = 0.62$, Table 1, Fig. 5). The small-scale occupancy of the sage thrasher declined over time in the high development stratum ($P = 0.91$), there was moderate support for a declining annual trend in the BLM reference area ($P = 0.80$), and little evidence for a declining trend in the low development stratum ($P < 0.60$, Table 2, Fig. 6).

The probability of a diminished trend in the high development stratum compared to the low development stratum was $P = 0.61$ for large-scale occupancy (Table 3, Fig. 5) and $P = 0.76$ for small-scale occupancy (Table 3, Fig. 6). The probability of a reduced trend in the high development stratum compared to the BLM reference area was $P = 0.73$ for large-scale occupancy (Table 3, Fig. 5) and $P = 0.93$ for small-scale occupancy (Table 3, Fig. 6).

The probability of detecting the sage thrasher varied by year and the mean detection probability across years was $\bar{p} = 0.79$ (Fig. 7).

In terms of management thresholds for the sage thrasher (Table 4, Table 5), there was little evidence for a $>10\%$ decline in large-scale occupancy for the high development stratum ($\Delta = -0.01$; $SD = 0.12$; $P = 0.22$) and marginal evidence of a $>10\%$ decline in small-scale occupancy for the high development stratum ($\delta = -0.13$; $SD = 0.10$; $P = 0.64$). There was marginal evidence the decline in large-scale occupancy was $>2\%$ in the high development stratum than the low development ($P = 0.58$) and BLM reference ($P = 0.71$) strata. For small-scale occupancy, there was marginal evidence the decline in occupancy was $>2\%$ in the high development stratum than the low development stratum ($P = 0.75$), and considerable evidence the decline was $>2\%$ in the high development stratum than the BLM reference stratum ($P = 0.91$).

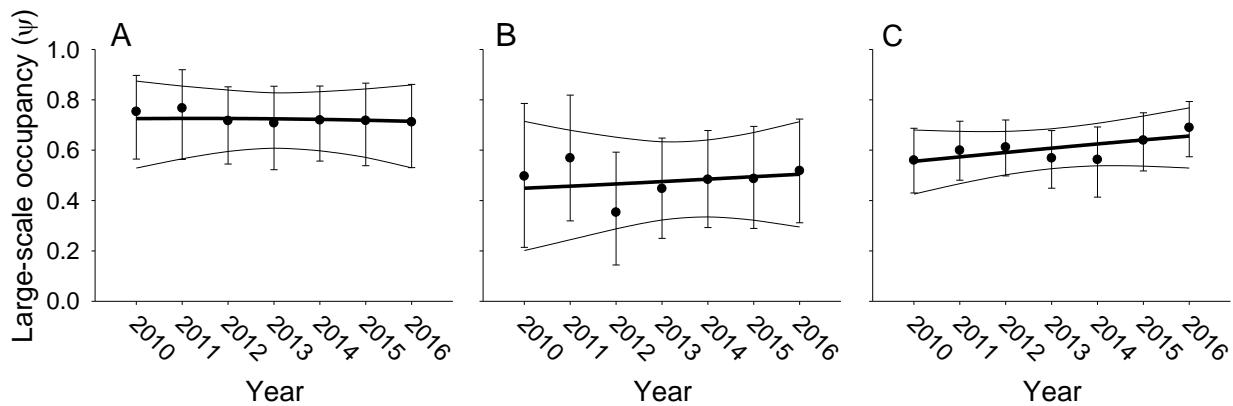


Figure 5. The large-scale occupancy of the sage thrasher in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

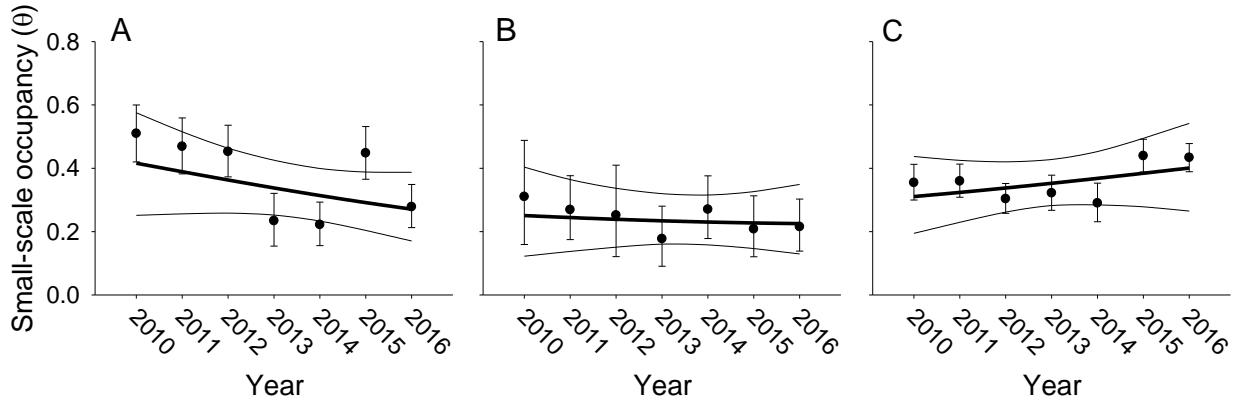


Figure 6. The small-scale occupancy of the sage thrasher in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

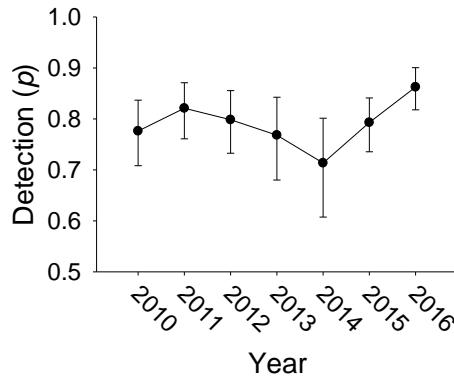


Figure 7. The detection of the sage thrasher by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.

Green-tailed towhee

The large-scale occupancy of the green-tailed towhee increased over time in the high development stratum ($P = 0.94$), but there was moderate evidence for temporal trends in the low development stratum ($P = 0.88$), and little support for a trend in the BLM reference area ($P = 0.71$, Table 1, Fig. 8). The small-scale occupancy of the green-tailed towhee increased over time in the low development stratum ($P = 0.92$), there was moderate evidence for temporal trends in the high development stratum ($P = 0.86$) and BLM reference area ($P = 0.83$, Table 2, Fig. 9).

The probability of a diminished trend in the high development stratum compared to the low development stratum was $P = 0.53$ for large-scale occupancy (Table 3, Fig. 8) and $P = 0.65$ for small-scale occupancy (Table 3, Fig. 9). The probability of a reduced trend in the high development stratum compared to the BLM reference area was $P = 0.16$ for large-scale occupancy (Table 3, Fig. 8) and $P = 0.50$ for small-scale occupancy (Table 3, Fig. 9).

The probability of detecting the green-tailed towhee varied by year and the mean detection probability across years was $\bar{p} = 0.77$ (Fig. 10).

In terms of management thresholds for the green-tailed towhee (Table 4, Table 5), there was little evidence for a >10% decline in the large-scale ($\Delta = 0.17$; $SD = 0.11$; $P = 0.01$) and small-scale ($\delta = 0.11$; $SD = 0.10$; $P = 0.02$) occupancy in the high development stratum. There was little evidence the change in large-scale occupancy was 2% smaller in the high development stratum than the low development ($P = 0.22$) and BLM reference ($P = 0.16$) strata. For small-scale occupancy, there was marginal evidence the change in occupancy was 2% smaller in the high development stratum than the low development stratum ($P = 0.59$), and little evidence the change was 2% smaller in the high development stratum than the BLM reference stratum ($P = 0.44$).

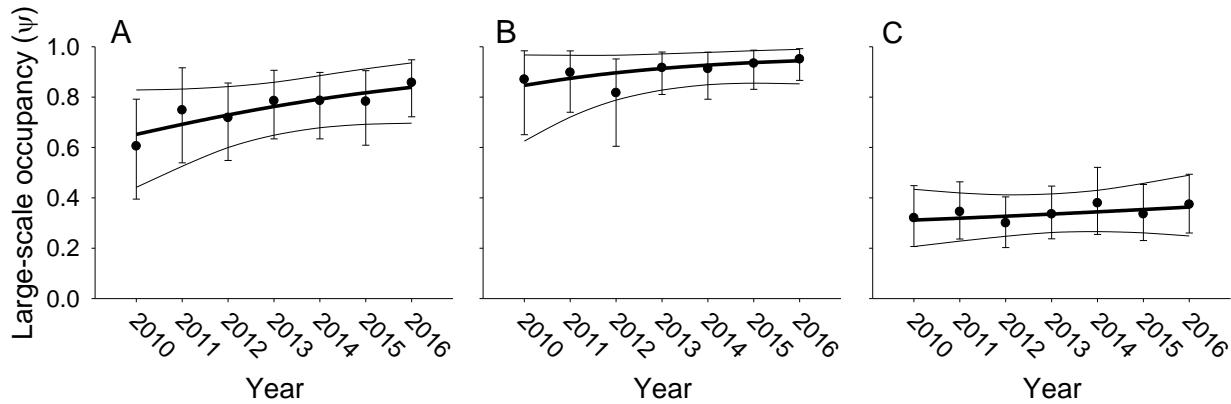


Figure 8. The large-scale occupancy of the green-tailed towhee in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

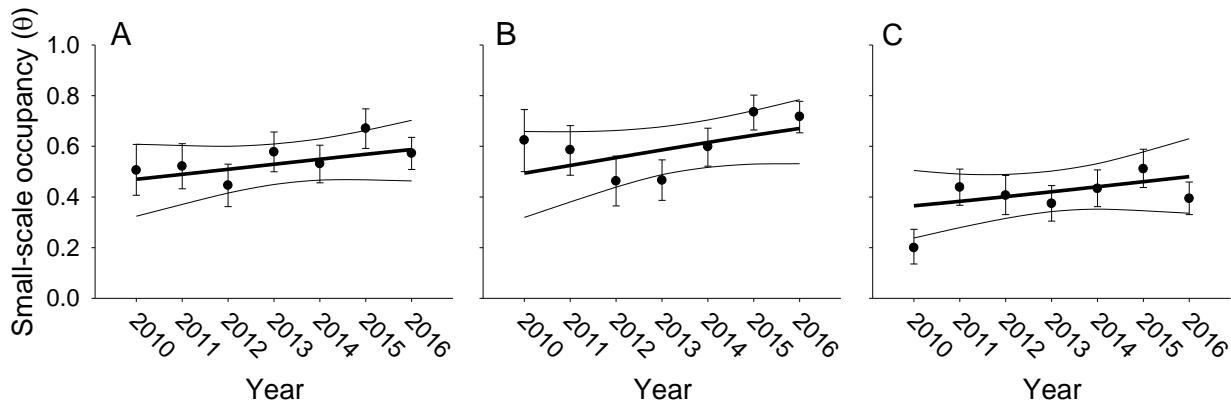


Figure 9. The small-scale occupancy of the green-tailed towhee in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

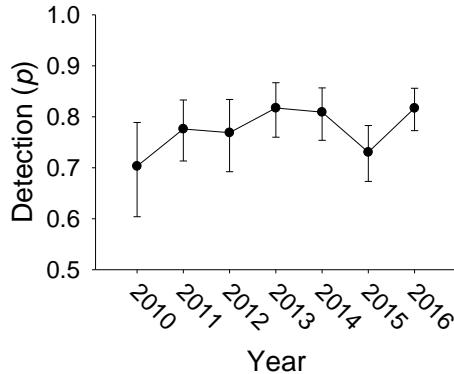


Figure 10. The detection of the green-tailed towhee by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.

Brewer's sparrow

The large-scale occupancy of the Brewer's sparrow increased over time in the BLM reference area ($P = 0.97$), and there was moderate evidence for temporal trends in the high ($P = 0.83$) and low development strata ($P = 0.87$, Table 1, Fig. 11). The small-scale occupancy of the Brewer's sparrow increased over time in the BLM reference area ($P = 0.96$), but there was less support for annual trends in the high ($P = 0.77$) and low development strata ($P = 0.61$, Table 2, Fig. 12).

The probability of a diminished trend in the high development stratum compared to the low development stratum was $P = 0.61$ for large-scale occupancy (Table 3, Fig. 11) and $P = 0.39$ for small-scale occupancy (Table 2, Fig. 12). The probability of a reduced trend in the high development stratum compared to the BLM reference area was $P = 0.49$ for large-scale occupancy (Table 3, Fig. 11) and $P = 0.75$ for small-scale occupancy (Table 3, Fig. 12).

The probability of detecting the Brewer's sparrow varied by year and the mean detection probability across years was $\bar{p} = 0.80$ (Fig. 13).

In terms of management thresholds for the Brewer's sparrow (Table 4, Table 5), there was little evidence for a >10% decline in the large-scale ($\Delta = 0.03$; SD = 0.03; $P = 0.00$) and small-scale ($\delta = 0.08$; SD = 0.10; $P = 0.04$) occupancy in the high development stratum. There was little evidence the change in large-scale occupancy was 2% smaller in the high development stratum than the low development stratum ($P = 0.43$), and moderate evidence the change was 2% smaller in the high development stratum than the BLM reference stratum ($P = 0.81$). For small-scale occupancy, there was little evidence the change in occupancy was 2% smaller in the high development stratum than the low development stratum ($P = 0.35$), and marginal evidence the change was 2% smaller in the high development stratum than the BLM reference stratum ($P = 0.73$).

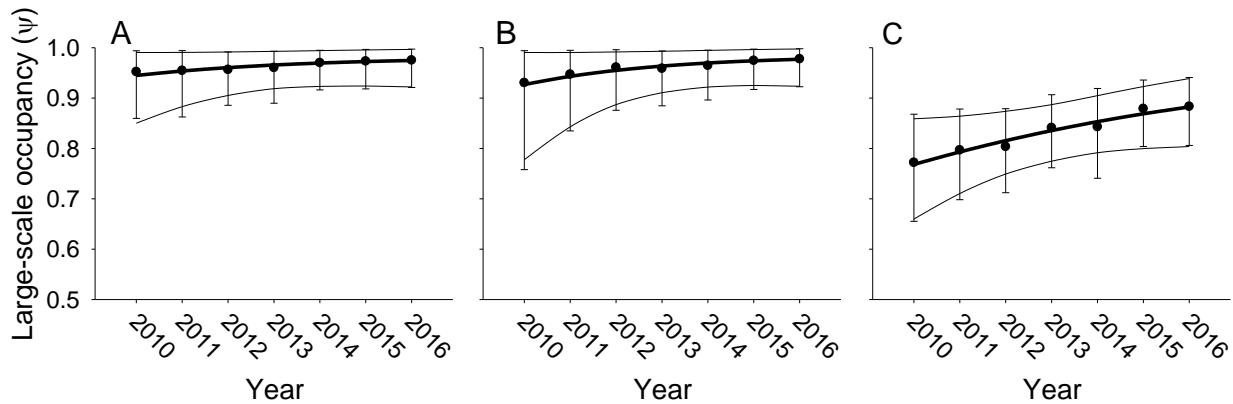


Figure 11. The large-scale occupancy of the Brewer's sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

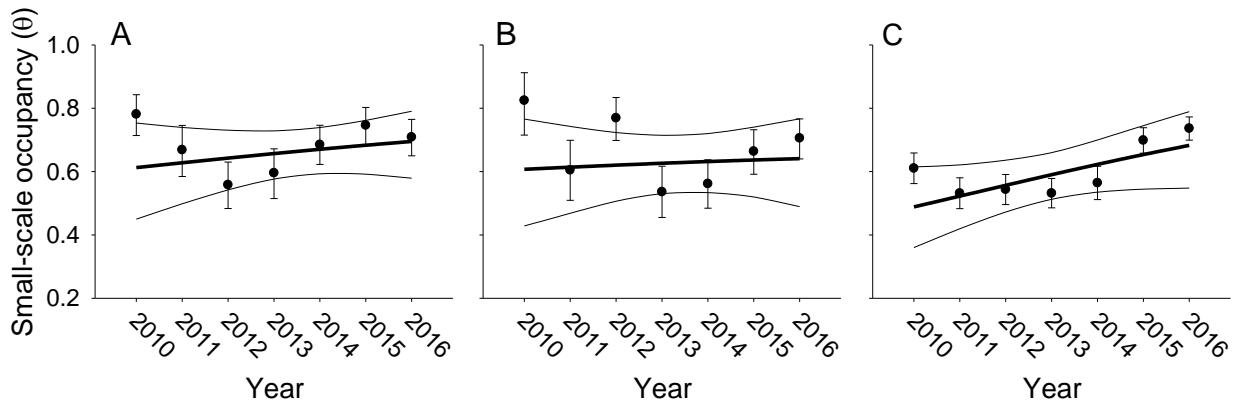


Figure 12. The small-scale occupancy of the Brewer's sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

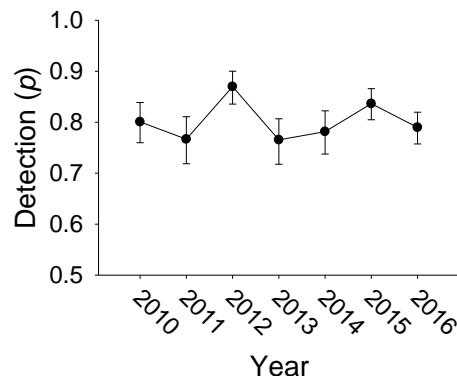


Figure 13. The detection of the Brewer's sparrow by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.

Sagebrush sparrow

We found little evidence for temporal trends in large-scale occupancy of the sagebrush sparrow across all regions investigated (all $P < 0.70$, Table 1, Fig. 14). The small-scale occupancy of the sagebrush sparrow increased over time in the BLM reference area ($P = 0.96$), but there was little evidence for temporal trends in the high ($P = 0.60$) and low development strata ($P = 0.69$, Table 2, Fig. 15).

The probability of a diminished trend in the high development stratum compared to the low development stratum was $P = 0.39$ for large-scale occupancy (Table 3, Fig. 14) and $P = 0.71$ for small-scale occupancy (Table 3, Fig. 15). The probability of a reduced trend in the high development stratum compared to the BLM reference area was $P = 0.64$ for large-scale occupancy (Table 3, Fig. 14) and $P = 0.91$ for small-scale occupancy (Table 3, Fig. 15).

The probability of detecting the sagebrush sparrow was lower in 2013 than in the other years and the mean detection probability across years was $\bar{p} = 0.82$ (Fig. 16).

In terms of management thresholds for the sagebrush sparrow (Table 4, Table 5), there was little evidence for a $>10\%$ decline in large-scale ($\Delta = -0.02$; $SD = 0.14$; $P = 0.27$) and small-scale ($\delta = -0.03$; $SD = 0.09$; $P = 0.19$) occupancy for the high development stratum. There was little evidence the decline in large-scale occupancy was $>2\%$ in the high development stratum than the low development stratum ($P = 0.37$), and marginal evidence the decline was $>2\%$ in the high development stratum than the BLM reference stratum ($P = 0.60$). For small-scale occupancy, there was marginal evidence the decline in occupancy was $>2\%$ in the high development stratum than the low development stratum ($P = 0.65$), and moderate evidence the decline was $>2\%$ in the high development stratum than the BLM reference stratum ($P = 0.90$).

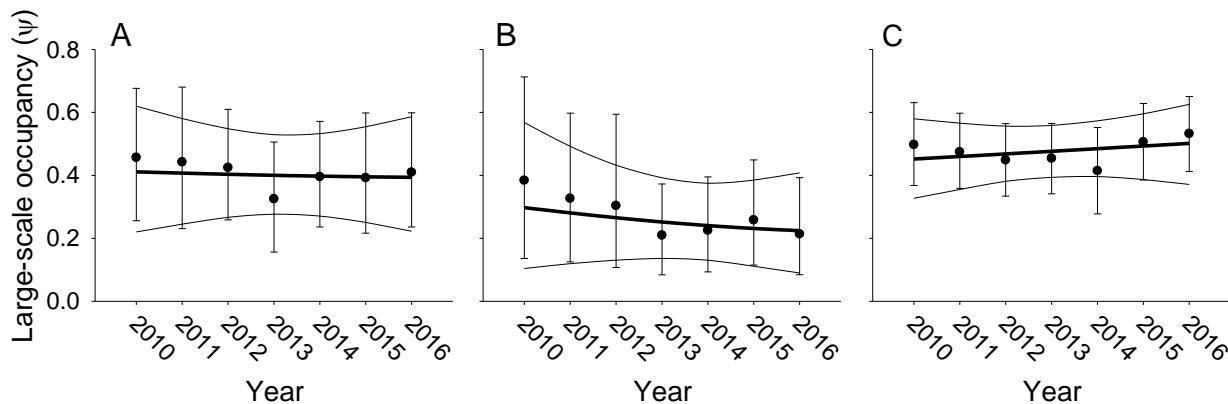


Figure 14. The large-scale occupancy of the sagebrush sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of large-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

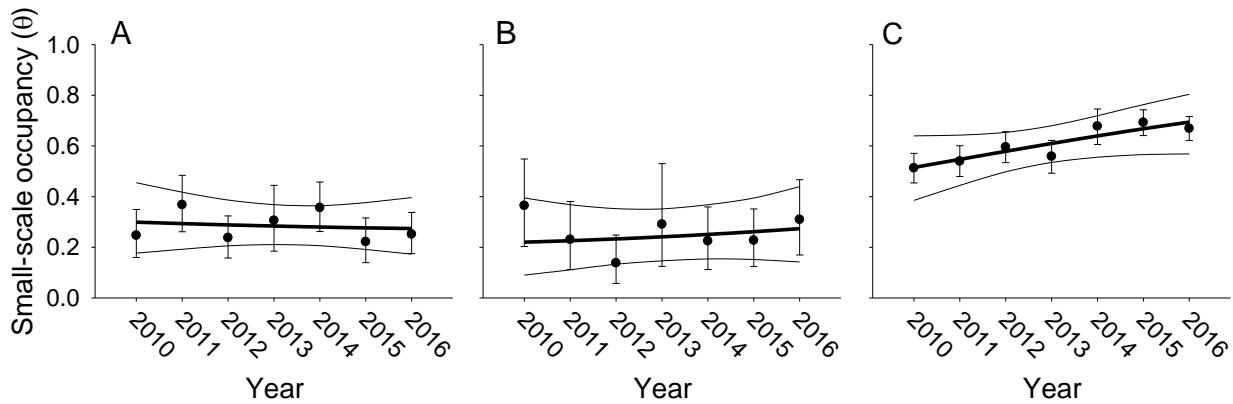


Figure 15. The small-scale occupancy of the sagebrush sparrow in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of small-scale occupancy, and the error bars and bounding lines are 95% Credible Intervals.

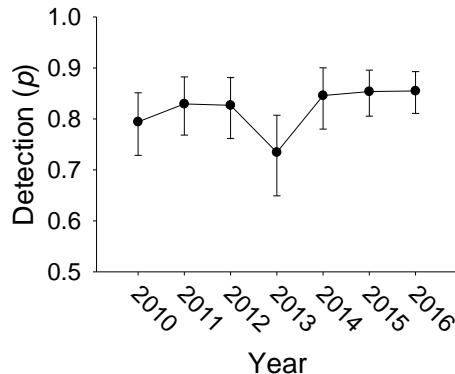


Figure 16. The detection of the sagebrush sparrow by year in the Atlantic Rim Natural Gas Development Project Area and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols are estimates of detection and the error bars are 95% Credible Intervals.

Species richness

Sagebrush obligates.— The species richness of sagebrush obligates increased over time in the BLM reference area ($P = 0.92$), but there was less evidence for annual trends in the high and low development strata ($P < 0.84$, Table 6, Fig. 17). Considering the variation in species richness, the mean species richness of sagebrush obligate species across years was similar in the high ($\bar{x} = 3.2$) and low ($\bar{x} = 3.0$) development strata, and mean species richness was greater in both Atlantic Rim strata than in the BLM reference area ($\bar{x} = 2.3$; Fig. 17).

Table 6. Mean parameter estimates for the annual trend (β_3), Standard Deviation (SD), Lower (LCL) and Upper (UCL) 95% Credible Limits, respectively, and the probability the trend is greater or less than zero [$P(\beta_3|0)$] for large-scale richness of species guilds within the high and low development strata of the Atlantic Rim Natural Gas Development Project Area, and Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016.

	Mean	SD	LCL	UCL	$P(\beta_3 0)$
High development					
Generalist	0.051	0.054	-0.054	0.159	0.830
Grassland	0.018	0.050	-0.079	0.115	0.640
Riparian	0.007	0.057	-0.106	0.118	0.554
Woodland	0.019	0.053	-0.083	0.123	0.643
Sagebrush	0.063	0.064	-0.064	0.186	0.838
Shrubland	0.081	0.063	-0.036	0.209	0.910
Low development					
Generalist	0.158	0.084	-0.007	0.328	0.970
Grassland	0.112	0.077	-0.047	0.273	0.928
Riparian	0.092	0.091	-0.095	0.271	0.852
Woodland	0.104	0.083	-0.061	0.271	0.901
Sagebrush	0.134	0.086	-0.032	0.306	0.944
Shrubland	0.151	0.093	-0.030	0.339	0.951
BLM reference area					
Generalist	0.054	0.036	-0.017	0.125	0.938
Grassland	0.031	0.032	-0.037	0.094	0.833
Riparian	0.038	0.037	-0.037	0.111	0.856
Woodland	0.030	0.032	-0.036	0.093	0.824
Sagebrush	0.054	0.037	-0.021	0.128	0.923
Shrubland	0.029	0.042	-0.056	0.111	0.766

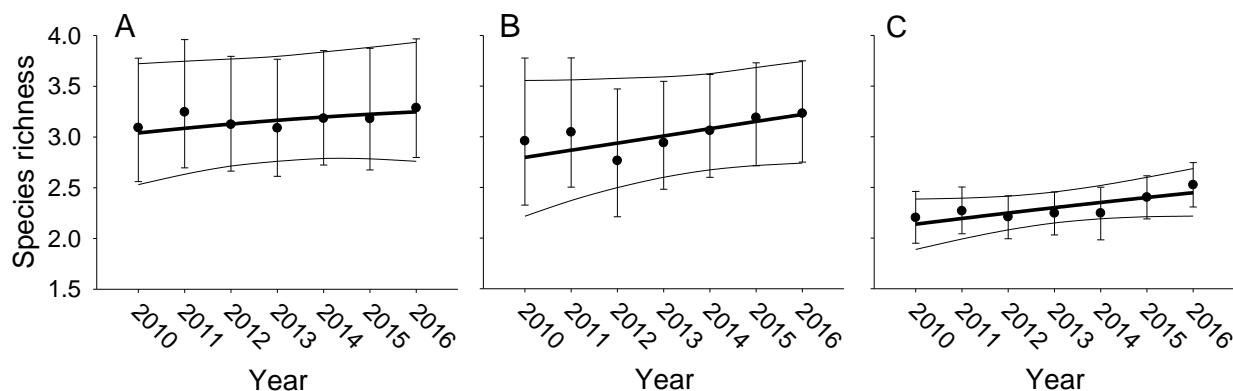


Figure 17. The species richness of sagebrush obligates in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

Shrubland species.— The species richness of shrubland birds increased over time in the low development stratum ($P = 0.93$), but there was less evidence for temporal trends in low development stratum and BLM reference area ($P < 0.90$, Table 6, Fig. 18). Considering the variation in species richness, the mean species richness of shrubland birds across years was similar in the high ($\bar{x} = 1.8$) and low ($\bar{x} = 1.6$)

development strata, and species richness was greater in the high development stratum than the BLM reference area ($\hat{x} = 1.0$; Fig. 18).

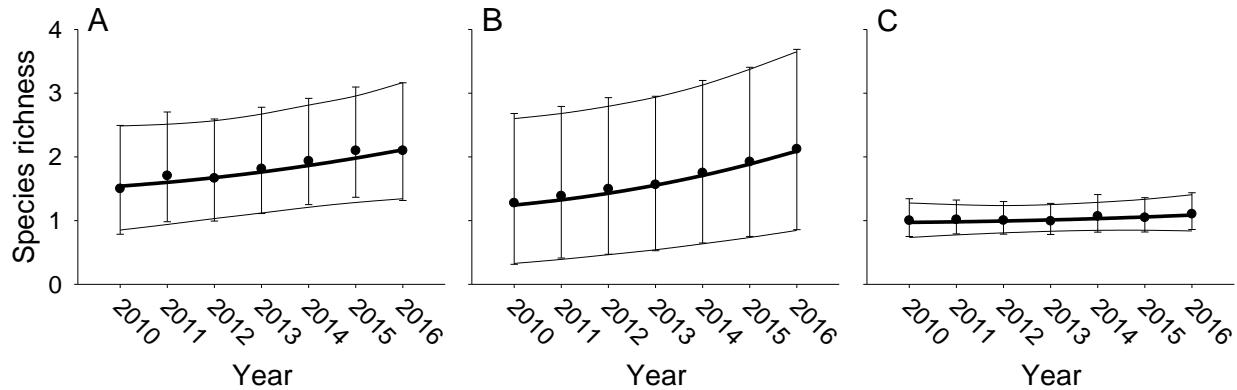


Figure 18. The species richness of shrubland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

Generalist species.— The species richness of generalist birds increased over time in the low development stratum and BLM reference area ($P > 0.96$), but there was less evidence for an annual trend in the high development stratum ($P < 0.90$, Table 6, Fig. 19). Considering the variation in species richness, the mean species richness of generalist birds across years was lower in the high development stratum ($\bar{x} = 3.1$) than the low development stratum ($\bar{x} = 4.5$), and mean species richness was greater in the Atlantic Rim strata than the BLM reference area ($\bar{x} = 1.7$; Fig. 19).

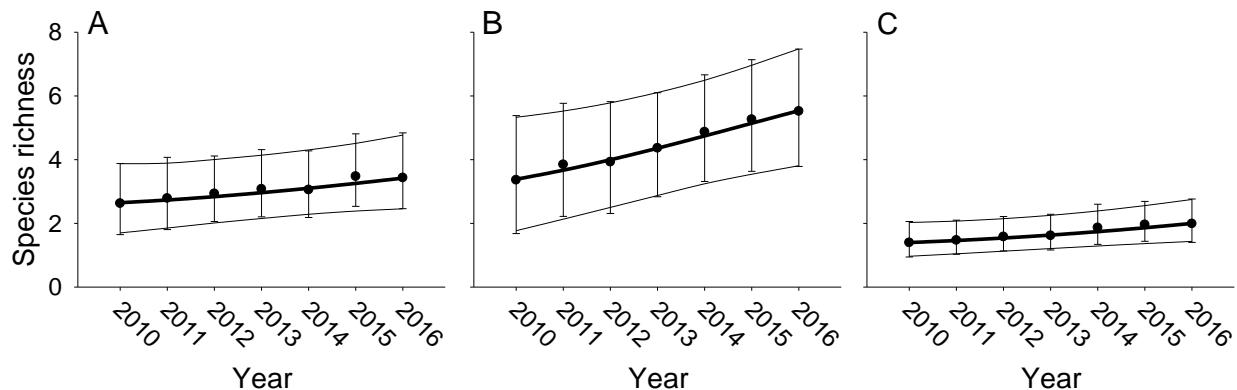


Figure 19. The species richness of generalist birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

Grassland species.— The species richness of grassland birds increased over time in the low development stratum and BLM reference area ($P > 0.95$), but there was less evidence for an annual trend in the high development stratum ($P = 0.72$, Table 6, Fig. 20). Considering the variation in species richness, the mean species richness of grassland birds across years was similar in the high ($\bar{x} = 5.9$) and low ($\bar{x} = 7.0$) development strata, and mean species richness was greater in both Atlantic Rim strata compared to the BLM reference area ($\bar{x} = 3.8$; Fig. 20).

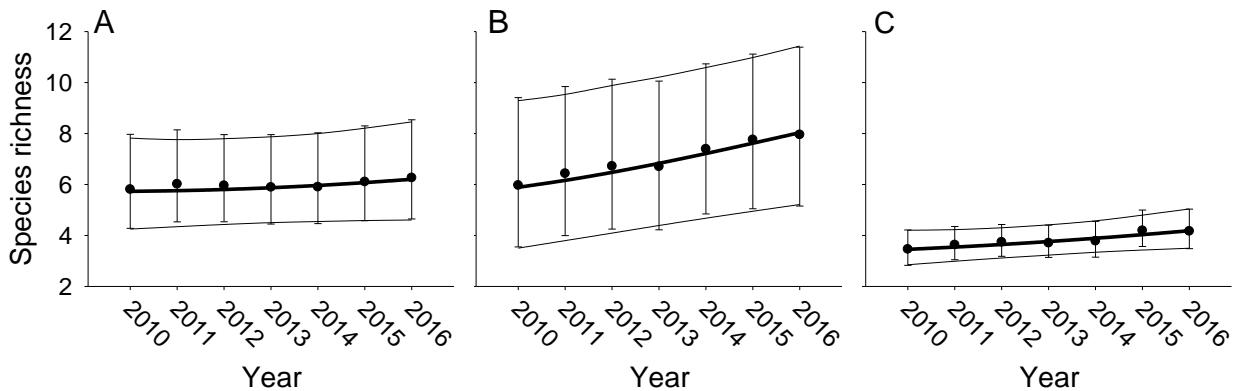


Figure 20. The species richness of grassland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

Riparian species.— The species richness of riparian birds increased over time in the low development stratum ($P > 0.90$), but there was less evidence for annual trends in high development stratum and BLM reference area ($P < 0.87$, Table 6, Fig. 21). Considering the variation in species richness, the mean species richness of riparian birds across years was similar in the high ($\bar{x} = 2.0$) and low ($\bar{x} = 2.2$) development strata, and mean species richness was greater in both Atlantic Rim strata compared to the BLM reference area ($\bar{x} = 0.7$; Fig. 21).

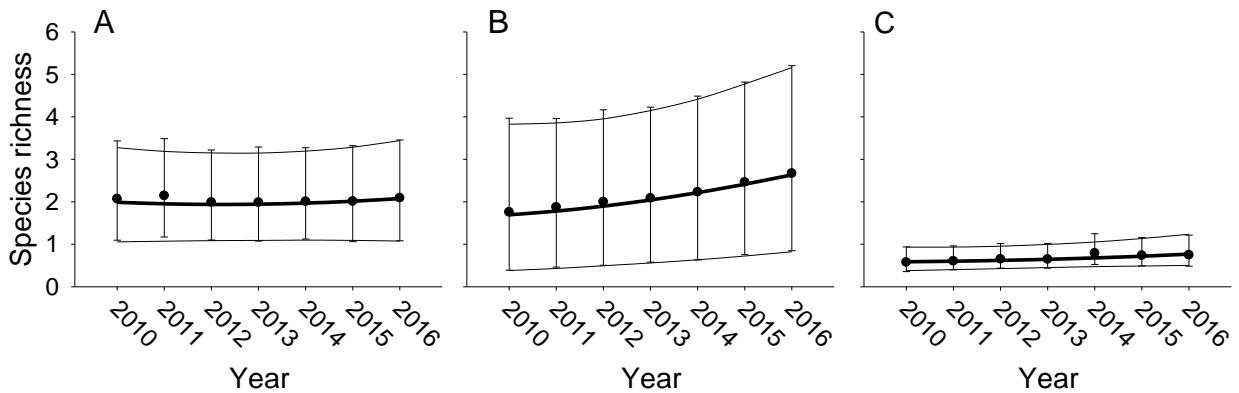


Figure 21. The species richness of riparian birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

Woodland species.— The species richness of woodland birds increased over time in the low development stratum and BLM reference area ($P > 0.90$), but there was less evidence for an annual trend in the high development stratum ($P < 0.85$, Table 6, Fig. 22). Considering the variation in species richness, the mean species richness of woodland birds across years was similar in the high ($\bar{x} = 3.7$) and low ($\bar{x} = 4.8$) development strata, and mean species richness was greater in the Atlantic Rim strata than in the BLM reference area ($\bar{x} = 2.3$; Fig. 22).

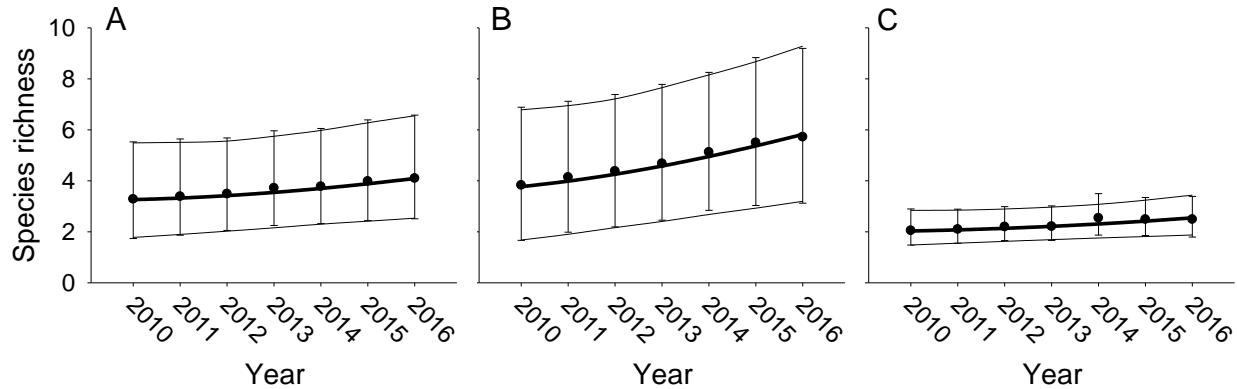


Figure 22. The species richness of woodland birds in the A) high and B) low development strata of the Atlantic Rim Natural Gas Development Project Area, and C) Bureau of Land Management (BLM) reference area, Wyoming, 2010 – 2016. The bold symbols and trend lines are estimates of mean species richness, and the error bars and bounding lines are 95% Credible Intervals.

DISCUSSION

Our use of the IMBCR sampling data collected on BLM lands within the Wyoming portion of BCR 10 provided a representative and regional-scale contrast for comparisons in species occupancy and richness. We believe these comparisons are critical because regional-scale impacts such as potential climate change and habitat loss on wintering grounds of migratory species may impact occupancy rates throughout Wyoming. As such, perceived differences in occupancy rates for species within the Atlantic Rim may be attributed to local-scale management actions when, in fact, regional-scale factors may be the true drivers. Our ability to use the BLM lands throughout Wyoming BCR 10 as a regional contrast therefore prevented this potential confounding and allowed for a more robust contrast in our study.

In the following paragraphs we summarize our analytical findings within the context of the performance thresholds developed for the Atlantic Rim development area. The threshold for the four sagebrush-associated priority species can be broken up into three separate conditions, all of which must be met or exceeded to trigger mitigation and/or adaptive management. The first condition (1) indicates the large-scale (Δ) or small-scale (δ) occupancy of a species must be estimated to be declining by at least 10% (≤ -0.10) within the high-development area of the Atlantic Rim. The second condition (2) states the probability of the decline must be $\geq 90\%$ ($P|\Delta < -0.1$). The third condition (3) states the decline must exceed perceived declines in the two reference strata ($P|HI < LOW - 0.02$ and $P|HI < BLM - 0.02$). Tables 4 (large-scale) and 5 (small-scale) in the Results section directly address these three conditions; however, we will summarize below. We have additionally included a discussion of the greater sage-grouse given it's recent consideration for special status at the federal level.

Condition 1 was not met for the sage thrasher at the large-scale but was exceeded at the small-scale, with an estimated decline in occupancy of 13.2%. We estimated there is a 64.3% probability this decline exceeds 10%, which did not meet the required 90% threshold (condition 2). Condition 3 for the sage thrasher was met with a 91.3% probability that the small-scale decline observed exceeded declines in the BLM reference condition. As such, two of the three threshold conditions were met or exceeded for sage thrasher in the Atlantic Rim project area, indicating there may be cause for some concern among resource managers. It is possible that with continued sampling and improved precision of the occupancy estimates, the estimated probability of a decline in sage thrasher occupancy will increase (condition 2) and all threshold conditions will be met and/or exceeded within the Atlantic Rim project area.

Condition 1 was not met for the green-tailed towhee at the large- or small-scale. We estimated occupancy

rates were increasing over time at both scales. Therefore, condition 2 was not met for the green-tailed towhee either, as there was little support for a negative decline of 10% or more. Large- and small-scale occupancy trends were similar across the low-development region and the two reference regions, with little support for condition 3 of the threshold statement for green-tailed towhee. In total, green-tailed towhee occupancy appears stable across the three regions investigated and none of the three conditions were met or exceeded, indicating little reason for concern among resource managers in the area.

Condition 1 was not met for the Brewer's sparrow at the large- or small-scale. Occupancy rates were estimated to be increasing over time at both scales within the high-development area of the Atlantic Rim. Therefore, condition 2 was not met for the Brewer's sparrow either. Brewer's sparrow occupancy appears to be increasing at a higher rate in the BLM reference area compared to the Atlantic Rim area, with there being some evidence the rate of change in occupancy within the high-development region exceeds 2% compared to the BLM reference area at both the large- (81.0%) and small-scale (72.5%). Those probabilities did not meet the 90% requirement for condition 3; however. In total, the fact occupancy rates for Brewer's sparrow increased across all three regions and that zero of the three conditions associated with the threshold were met, indicates there is little reason for concern among resource managers in the area at this time.

Condition 1 was not met for the sagebrush sparrow at the large- or small-scale. Occupancy rates were estimated to be decreasing over time at both scales but decreases were estimated at 1.5% and 2.2% for the large- and small-scale; respectively. Given the estimated low rate of decline in occupancy, there is little support for a 10% decline to be occurring at the large- (27.1%) or small-scale (18.8%). Therefore, condition 2 was not met for sagebrush sparrow. Although sagebrush sparrow occupancy was estimated to be declining in the high-development area at both large- and small-scales, small-scale occupancy may be increasing in both of the reference areas. This contrast resulted in moderate evidence (89.6%) that the small-scale sagebrush sparrow occupancy declines in the high-development area are exceeding trends in the BLM reference condition. This probability nearly meets threshold condition 3 for the sagebrush sparrow. While none of the 3 conditions associated with the threshold were met, we believe resource managers in the area may want to continue monitoring this species. This is a result of the estimated declines in sagebrush sparrow occupancy within the high-development region at both scales the fact that condition 3 was nearly satisfied; indicating sagebrush sparrow occupancy is likely declining in the high-development region relative to the reference areas.

Although greater sage-grouse were not included in the Atlantic Rim threshold document for sagebrush-dependent songbirds, we will briefly review our analytical results in the context of those thresholds in the event this information is of use to resource managers. We observed an increase in sage-grouse large-scale occupancy and a slight decrease in small-scale occupancy within the high-development region of the Atlantic Rim. The decline in small-scale occupancy was estimated at 0.2% which does not meet condition 1. The estimated probability this slight decline actually exceeds 10% is very low (0.2%) and does not meet threshold condition 2. We observed a 27% increase in sage-grouse occupancy at the large-scale in the low-development region compared to a 1.9% increase in the high-development region of the Atlantic Rim which provides moderate evidence (82.6%) for, but does not meet, condition 3. At the small-scale, there is also moderate evidence (80.6%) for lower occupancy in the high-development region compared to the BLM reference area, but this again did not satisfy the 90% probability required to meet condition 3. In total, greater sage-grouse occupancy seems quite stable in the high-development region of the Atlantic Rim but trends are lower than in the reference conditions, indicating resource managers may wish to continue monitoring for sage-grouse to ensure resource extraction activities are not negatively impacting sage-grouse in the high-development area.

No focal species investigated met all three conditions to satisfy the shrub-dependent songbird performance threshold; however, our results provide evidence that sage thrasher, sagebrush sparrow, and

greater sage-grouse occupancy may be negatively impacted by resource extraction activities in the high-development region of the Atlantic Rim. Sage thrasher (Reynolds et al. 1999) and sagebrush sparrow (Martin and Carlson 1998) may be sensitive to any loss in overall sagebrush cover and/or habitat fragmentation (Wiens and Rotenberry 1995). Previous analysis of road densities within the Atlantic Rim found gravel road densities were nearly twice as high in the high-development region of the Atlantic Rim than in the low-development region (Van Lanen et al. 2012). Road development directly leads to a reduction of vegetative cover and therefore an increase in habitat fragmentation.

An abundance of research has demonstrated sagebrush birds are negatively impacted by resource extraction activities. Gilbert and Chalfoun (2011) determined sagebrush sparrow abundance declined within the Jonas Field of Wyoming when well densities were high. Similarly, another study demonstrated sagebrush sparrow densities declined by 39–60% near roadways associated with energy development in the Jonas Field (Ingelfinger and Anderson 2004). Mutter et al. (2015) directly evaluated the impact of road densities in the Atlantic Rim project area on sagebrush-associated songbirds and found higher road densities resulted in lower landscape-scale occupancy rates for sagebrush sparrow and sage thrasher. We should note; however, data used in that study and in the present document are not fully independent. Studies of negative impacts of roads and wells associated with energy development are not restricted to songbirds, but extend to sage-grouse as well. For instance, Green et al. (2017) showed declines in greater sage-grouse lek counts as a function of oil and gas well densities.

Although we focus our evaluation of single-species occupancy rates on the five sagebrush-associated species, we do note considerably and significantly higher occupancy rates of American crow (*Corvus brachyrhynchos*) within the high development compared to the low development regions of the Atlantic Rim. American crows represent a potential nest predator for the five focal sagebrush-associated species discussed in this report and may also contribute to some of the diminished trends in occupancy previously discussed. We did not explicitly investigate this potential interaction but do recommend future studies include the possible impact of both American crow and common raven (*Corvus corax*) on the sagebrush-associated species we investigated.

Thus far we have highlighted our evaluation of individual species occupancy rates in the Atlantic Rim. One benefit to the occupancy approach we employed is that robust multi-species assessment is possible. Our multi-species occupancy approach allowed us to estimate species richness within the areas of interest. Our analytic approach allowed us to incorporate the presence of rare species, resulting in improved estimates of species richness, which better reflect the overall community. In contrast, single-species models could be applied to a subset of species, and estimates of large-scale occupancy for the set of species could be summed to estimate species richness. However, because species richness from single-species models are based on a subset of species (only containing those more common species with sufficient data), the estimates of species richness may not adequately represent bird communities comprised of several rare species.

The results of our species richness analysis failed to support our hypotheses that richness of the generalist guild would increase and the sagebrush guild would decrease in the high development stratum compared to the contrasts. We found no significant trends in the richness of any of the guilds we investigated. Of note; however, was the significantly higher species richness values for the Atlantic Rim region compared to other BLM lands in the Wyoming portion of BCR 10 across nearly all guilds investigated. This indicates the Atlantic Rim region represents important habitat for a wide range of species and supports a diverse community. As such, we urge land managers of the region to continue to evaluate potential impacts on the avian community when making management decisions.

LITERATURE CITED

- Bird Conservancy of the Rockies. 2017. The Rocky Mountain Avian Data Center. [web application]. Brighton, CO. <http://adc.rmbo.org>. Accessed: July 25, 2017.
- Buckland, S. T., D. R. Anderson, K. P. Burnham, J. L. Laake, D. L. Borchers, and L. Thomas. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, Oxford, UK.
- Bureau of Land Management (BLM). 2007. Record of Decision Environmental Impact Statement for the Atlantic Rim Natural Gas Field Development Project Carbon County, Wyoming. United States Department of the Interior, Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming, USA. <<https://eplanning.blm.gov/epl-front-office/projects/nepa/64748/78077/87795/ROD.pdf>>. Accessed 2 January 2018.
- _____. 2013. Shrub-dependent songbird performance thresholds. Instruction Memorandum No. WYD-03-2013-007. United States Department of the Interior, Bureau of Land Management, Rawlins Field Office, Rawlins, Wyoming, USA. <<https://eplanning.blm.gov/epl-front-office/projects/nepa/64748/78098/87946/IMSDS071513.pdf>>. Accessed 2 January 2018.
- Gelman, A., and D. B. Rubin. 1992. Inference from iterative simulation using multiple sequences. *Statistical Science* 7:457-472.
- Gilbert, M., and A. Chalfoun. 2011. Energy development affects populations of sagebrush songbirds in Wyoming. *Journal of Wildlife Management* 75(4):816-824.
- Green, A.W., C.L. Aldridge, and M.S. O'Donnell. 2017. Investigating impacts of oil and gas development on greater sage-grouse. *Journal of Wildlife Management* 81(1): 46-57.
- Hobbs, N. T., and M. B. Hooten. 2015. Bayesian models: a statistical primer for ecologists. Princeton University Press, Princeton, New Jersey, USA.
- Holloran, M. J. 2005. Greater Sage-Grouse (*Centrocercus urophasianus*) Population Response to Natural Gas Field Development in Western Wyoming. Dissertation, University of Wyoming, Laramie, Wyoming, USA.
- Ingelfinger, F., and S. Anderson. 2004. Passerine Response To Roads Associated With Natural Gas Extraction In A Sagebrush Steppe Habitat. *Western North American Naturalist* 64:385-395.
- Kéry, M., and J. A. Royle. 2009. Inference about species richness and community structure using species-specific occupancy models in the National Swiss Breeding Bird Survey MHB. Pages 639-656 in D. L. Thomson, E. G. Cooch, and M. J. Conroy, editors. Modeling demographic processes in marked populations. Springer, New York, New York, USA.
- MacKenzie, D. I., J. D. Nichols, J. A. Royle, K. H. Pollock, L. L. Bailey, and J. E. Hines. 2006. Occupancy estimation and modeling: inferring patterns and dynamics of species occurrence. Elsevier, Burlington, Massachusetts, USA.
- Martin, J.W., and B.A. Carlson. 1998. *Sagebrush Sparrow (Artemisiospiza nevadensis)*, version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA. Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/sagspa1>
- Mordecai, R. S., B. J. Mattsson, C. J. Tzilkowski, and R. J. Cooper. 2011. Addressing challenges when studying mobile or episodic species: hierarchical Bayes estimation of occupancy and use. *Journal of Applied Ecology* 48:56-66.
- Mutter, M., D.C. Pavlacky, Jr., N.J. Van Lanen, and R. Grenyer. 2015. Evaluating the impacts of gas extraction infrastructure on the occupancy of sagebrush-obligate songbirds. *Ecological Applications* 25(5): 1175-1186.
- Pavlacky, D. C., Jr., J. A. Blakesley, G. C. White, D. J. Hanni, and P. M. Lukacs. 2012. Hierarchical multi-scale occupancy estimation for monitoring wildlife populations. *Journal of Wildlife Management* 76:154-162.

- Pavlacky, D. C., Jr., P. M. Lukacs, J. A. Blakesley, R. C. Skorkowsky, D. S. Klute, B. A. Hahn, V. J. Dreitz, T. L. George, and D. J. Hanni. 2017. A statistically rigorous sampling design to integrate avian monitoring and management within Bird Conservation Regions. *PLOS ONE* 12:e0185924.
- Plummer, M. 2003. JAGS: A program for analysis of Bayesian graphical models using Gibbs sampling. *In* K. Hornik, F. Leisch, and A. Zeileis, editors. *Proceedings of the 3rd International Workshop on Distributed Statistical Computing (DSC 2003)*, March 20–22. Austrian Association for Statistical Computing and R Foundation for Statistical Computing, Vienna, Austria. <<https://www.r-project.org/conferences/DSC-2003/Proceedings/Plummer.pdf>>. Accessed June 2017.
- _____. 2015. JAGS Version 4.0.0 user manual. SourceForge Media, La Jolla, California, USA. <<https://sourceforge.net/projects/mcmc-jags/files/Manuals/4.x>>. Accesed June 2017.
- R Core Team. 2017. R: a language and environment for statistical computing. Version 3.3.3. R Foundation for Statistical Computing, Vienna, Austria. <<https://www.r-project.org/>>. Accesed June 2017.
- Reynolds, Timothy D., Terrell D. Rich and Daniel A. Stephens. 1999. Sage Thrasher (*Oreoscoptes montanus*), version 2.0. In *The Birds of North America* (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA. <https://doi.org/10.2173/bna.463>
- Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, and T. C. Will. 2004. Partners in Flight North American landbird conservation plan. Cornell Lab of Ornithology, Ithaca, New York, USA.
- Royle, J. A., and R. M. Dorazio. 2008. Hierarchical modeling and inference in ecology: the analysis of data from populations, metapopulations and communities. Academic Press, Amsterdam, Netherlands.
- Stevens, D. L., Jr., and A. R. Olsen. 2004. Spatially balanced sampling of natural resources. *Journal of the American Statistical Association* 99:262-278.
- US North American Bird Conservation Initiative Committee. 2009. *The State of the Birds, United States of America, 2009*. U.S. Department of Interior, Washington, D.C., USA.
- Van Lanen, N. J., D. C. Pavlacky, Jr., and D. J. Hanni. 2012. Monitoring birds in the Atlantic Rim Natural Gas Development Project Area: 2011 report. Technical Report SC-ARIM-02. Rocky Mountain Bird Observatory, Brighton, Colorado, USA.
- Wiens, S., and J. Rotenberry. 1995. Landscape characteristics of fragmented shrubsteppe habitats and breeding passerine birds. *Conservation Biology* 9(5):1059 - 1071.
- White, C. M., N. J. V. Lanen, D. C. Pavlacky, Jr., J. A. Blakesley, R. A. Sparks, M. F. McLaren, J. J. Birek, and D. J. Hanni. 2013. Integrated Monitoring in Bird Conservation Regions (IMBCR): 2012 annual report. Rocky Mountain Bird Observatory, Brighton, Colorado, USA.
- Whittaker, R. J., K. J. Willis, and R. Field. 2001. Scale and species richness: towards a general, hierarchical theory of species diversity. *Journal of Biogeography* 28:453-470.
- Zipkin, E. F., A. Dewan, and J. A. Royle. 2009. Impacts of forest fragmentation on species richness: a hierarchical approach to community modelling. *Journal of Applied Ecology* 46:815-822.

APPENDIX A. ESTIMATES OF LARGE-SCALE OCCUPANCY (MEAN), STANDARD DEVIATION (SD), AND LOWER (LCL) AND UPPER (UCL) 95% CREDIBLE LIMITS, RESPECTIVELY FOR ALL SPECIES DETECTED BY YEAR AND CONTRAST, WYOMING, 2010 – 2016.

Common Name	Year	Contrast	Mean	SD	LCL	UCL
American Crow	2010	High Development	0.431	0.244	0.073	0.938
		Low Development	0.075	0.095	0.004	0.345
		BLM Reference	0.053	0.056	0.007	0.209
	2011	High Development	0.391	0.255	0.049	0.934
		Low Development	0.096	0.1	0.008	0.378
		BLM Reference	0.051	0.052	0.008	0.2
	2012	High Development	0.42	0.245	0.077	0.931
		Low Development	0.073	0.088	0.004	0.335
		BLM Reference	0.053	0.054	0.008	0.204
	2013	High Development	0.434	0.251	0.075	0.948
		Low Development	0.075	0.074	0.009	0.274
		BLM Reference	0.055	0.055	0.009	0.211
	2014	High Development	0.423	0.258	0.064	0.948
		Low Development	0.08	0.079	0.01	0.294
		BLM Reference	0.066	0.065	0.01	0.249
	2015	High Development	0.445	0.266	0.061	0.958
		Low Development	0.098	0.092	0.013	0.342
		BLM Reference	0.066	0.065	0.01	0.255
	2016	High Development	0.449	0.271	0.059	0.966
		Low Development	0.102	0.099	0.013	0.365
		BLM Reference	0.07	0.071	0.01	0.268
American Goldfinch	2010	High Development	0.059	0.12	0	0.433

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.084	0.171	0	0.717
		BLM Reference	0.047	0.037	0.009	0.148
	2011	High Development	0.059	0.122	0	0.457
		Low Development	0.087	0.174	0	0.702
Burrowing Owl	2012	BLM Reference	0.041	0.034	0.009	0.137
		High Development	0.057	0.118	0	0.441
	2013	Low Development	0.092	0.182	0	0.759
		BLM Reference	0.043	0.036	0.009	0.144
Burrowing Owl	2014	High Development	0.058	0.121	0	0.449
		Low Development	0.098	0.187	0	0.769
	2015	BLM Reference	0.04	0.035	0.008	0.138
		High Development	0.06	0.123	0	0.474
Burrowing Owl	2016	Low Development	0.106	0.197	0	0.795
		BLM Reference	0.046	0.042	0.008	0.164
	2017	High Development	0.062	0.129	0	0.495
		Low Development	0.115	0.209	0	0.828
Burrowing Owl	2018	BLM Reference	0.04	0.039	0.007	0.147
		High Development	0.063	0.132	0	0.498
	2019	Low Development	0.125	0.222	0	0.878
		BLM Reference	0.04	0.041	0.005	0.158
American Kestrel	2010	High Development	0.078	0.15	0	0.584
		Low Development	0.093	0.179	0	0.715
		BLM Reference	0.044	0.032	0.01	0.129
American Kestrel	2011	High Development	0.079	0.154	0	0.626

Common Name	Year	Contrast	Mean	SD	LCL	UCL
American Robin	2010	Low Development	0.094	0.182	0	0.749
		BLM Reference	0.049	0.031	0.013	0.13
	2012	High Development	0.077	0.15	0	0.582
		Low Development	0.102	0.195	0	0.786
	2013	BLM Reference	0.045	0.028	0.013	0.119
		High Development	0.079	0.155	0	0.606
American Robin	2014	Low Development	0.104	0.198	0	0.822
		BLM Reference	0.042	0.025	0.012	0.107
	2015	High Development	0.08	0.157	0	0.634
		Low Development	0.111	0.207	0	0.853
	2016	BLM Reference	0.048	0.03	0.012	0.127
		High Development	0.084	0.163	0	0.659
American Robin	2011	Low Development	0.121	0.221	0	0.883
		BLM Reference	0.046	0.029	0.012	0.123
	2012	High Development	0.086	0.17	0	0.691
		Low Development	0.13	0.232	0	0.911
	2010	BLM Reference	0.045	0.029	0.011	0.121
		High Development	0.197	0.111	0.046	0.474
American Robin	2012	Low Development	0.428	0.225	0.07	0.889
		BLM Reference	0.179	0.048	0.096	0.289
	2011	High Development	0.327	0.128	0.129	0.625
		Low Development	0.54	0.182	0.211	0.902
	2010	BLM Reference	0.177	0.043	0.103	0.271
		High Development	0.238	0.082	0.105	0.423

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Blue Grosbeak</i>	2013	Low Development	0.511	0.196	0.166	0.901
		BLM Reference	0.171	0.04	0.1	0.258
	2014	High Development	0.241	0.082	0.108	0.425
		Low Development	0.642	0.136	0.37	0.896
	2015	BLM Reference	0.188	0.042	0.115	0.28
		High Development	0.205	0.069	0.09	0.357
		Low Development	0.706	0.12	0.461	0.92
<i>Ash-throated Flycatcher</i>	2016	BLM Reference	0.246	0.062	0.142	0.386
		High Development	0.238	0.083	0.105	0.419
		Low Development	0.755	0.111	0.516	0.943
	2010	BLM Reference	0.21	0.048	0.126	0.313
		High Development	0.243	0.08	0.108	0.418
		Low Development	0.771	0.104	0.551	0.949
<i>Blue Grosbeak</i>	2011	BLM Reference	0.162	0.043	0.088	0.256
		High Development	0.115	0.165	0.003	0.648
		Low Development	0.236	0.259	0.005	0.911
	2012	BLM Reference	0.018	0.041	0.001	0.101
		High Development	0.12	0.169	0.003	0.658
		Low Development	0.253	0.264	0.008	0.93
<i>Ash-throated Flycatcher</i>	2013	BLM Reference	0.018	0.039	0.001	0.093
		High Development	0.122	0.167	0.004	0.656
		Low Development	0.271	0.273	0.008	0.941
	2014	BLM Reference	0.018	0.041	0.001	0.1
		High Development	0.13	0.176	0.004	0.676

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Bank Swallow	2014	Low Development	0.307	0.271	0.016	0.949
		BLM Reference	0.019	0.042	0.001	0.102
	2015	High Development	0.136	0.181	0.004	0.698
		Low Development	0.317	0.282	0.015	0.964
	2016	BLM Reference	0.02	0.047	0.001	0.124
		High Development	0.16	0.197	0.005	0.754
		Low Development	0.34	0.292	0.016	0.974
Bank Swallow	2010	BLM Reference	0.019	0.044	0.001	0.115
		High Development	0.152	0.198	0.004	0.772
		Low Development	0.383	0.297	0.022	0.983
	2011	BLM Reference	0.021	0.047	0	0.127
		High Development	0.114	0.173	0.002	0.703
		Low Development	0.089	0.173	0	0.682
Bank Swallow	2012	BLM Reference	0.022	0.046	0.001	0.14
		High Development	0.117	0.176	0.002	0.702
		Low Development	0.09	0.174	0	0.706
	2013	BLM Reference	0.023	0.048	0.001	0.141
		High Development	0.118	0.174	0.003	0.713
		Low Development	0.096	0.183	0	0.74
Bank Swallow	2014	BLM Reference	0.023	0.05	0.001	0.151
		High Development	0.125	0.182	0.003	0.718
		Low Development	0.1	0.185	0	0.721
	2014	BLM Reference	0.024	0.053	0.001	0.147
		High Development	0.128	0.185	0.003	0.726

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Barn Swallow	2015	Low Development	0.107	0.196	0	0.782
		BLM Reference	0.025	0.058	0.001	0.171
	2016	High Development	0.151	0.201	0.004	0.8
		Low Development	0.116	0.205	0	0.805
	2010	BLM Reference	0.026	0.061	0.001	0.177
		High Development	0.145	0.203	0.003	0.797
		Low Development	0.125	0.218	0	0.844
Barn Swallow	2011	BLM Reference	0.028	0.067	0.001	0.194
		High Development	0.167	0.081	0.049	0.362
		Low Development	0.309	0.288	0.009	0.95
	2012	BLM Reference	0.246	0.164	0.05	0.668
		High Development	0.146	0.087	0.033	0.364
		Low Development	0.347	0.294	0.016	0.957
Barn Swallow	2013	BLM Reference	0.265	0.163	0.058	0.692
		High Development	0.133	0.075	0.036	0.316
		Low Development	0.361	0.299	0.016	0.966
	2014	BLM Reference	0.294	0.167	0.073	0.713
		High Development	0.118	0.078	0.026	0.322
		Low Development	0.329	0.307	0.012	0.965
Barn Swallow	2015	BLM Reference	0.271	0.17	0.057	0.712
		High Development	0.128	0.084	0.03	0.348
	2015	Low Development	0.339	0.318	0.011	0.973
		BLM Reference	0.268	0.182	0.047	0.729

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Bewick's Wren</i>	2016	Low Development	0.347	0.327	0.009	0.98
		BLM Reference	0.29	0.187	0.052	0.753
		High Development	0.129	0.107	0.019	0.416
	2010	Low Development	0.36	0.337	0.007	0.986
		BLM Reference	0.299	0.197	0.048	0.779
	2011	High Development	0.428	0.241	0.068	0.926
	2012	Low Development	0.507	0.297	0.044	0.985
		BLM Reference	0.244	0.169	0.049	0.705
		High Development	0.505	0.225	0.134	0.941
	2013	Low Development	0.535	0.289	0.061	0.987
		BLM Reference	0.245	0.168	0.054	0.704
		High Development	0.498	0.22	0.141	0.935
	2014	Low Development	0.629	0.26	0.123	0.99
		BLM Reference	0.263	0.17	0.062	0.719
		High Development	0.492	0.234	0.12	0.946
	2015	Low Development	0.617	0.265	0.128	0.991
		BLM Reference	0.274	0.175	0.065	0.739
		High Development	0.53	0.225	0.157	0.95
	2016	Low Development	0.658	0.254	0.152	0.994
		BLM Reference	0.29	0.186	0.063	0.775
	2015	High Development	0.611	0.203	0.236	0.959
		Low Development	0.663	0.265	0.141	0.996
	2016	BLM Reference	0.314	0.187	0.079	0.785
		High Development	0.565	0.235	0.151	0.967

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Black-billed Magpie	2010	Low Development	0.677	0.274	0.117	0.997
		BLM Reference	0.324	0.197	0.072	0.814
		High Development	0.12	0.078	0.023	0.324
	2011	Low Development	0.47	0.199	0.128	0.875
		BLM Reference	0.129	0.053	0.052	0.256
	2012	High Development	0.186	0.095	0.054	0.415
Black-capped Chickadee	2013	Low Development	0.55	0.171	0.232	0.881
		BLM Reference	0.142	0.049	0.065	0.255
		High Development	0.168	0.075	0.057	0.345
	2014	Low Development	0.513	0.186	0.175	0.884
		BLM Reference	0.147	0.047	0.072	0.253
		High Development	0.192	0.086	0.068	0.4
Blue Grosbeak	2015	Low Development	0.618	0.122	0.378	0.846
		BLM Reference	0.146	0.048	0.071	0.258
		High Development	0.216	0.088	0.082	0.424
	2016	Low Development	0.645	0.122	0.396	0.871
		BLM Reference	0.156	0.054	0.07	0.28
		High Development	0.394	0.115	0.198	0.643
Cassin's Vireo	2010	Low Development	0.652	0.107	0.433	0.848
		BLM Reference	0.212	0.057	0.118	0.343
		High Development	0.28	0.117	0.1	0.552
Chestnut-sided Warbler	2010	Low Development	0.717	0.118	0.475	0.923
		BLM Reference	0.231	0.062	0.127	0.373
		High Development	0.17	0.2	0.007	0.777

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2010	Low Development	0.135	0.188	0.003	0.752
		BLM Reference	0.02	0.032	0.002	0.091
	2011	High Development	0.178	0.206	0.008	0.806
		Low Development	0.139	0.188	0.004	0.781
	2012	BLM Reference	0.019	0.03	0.002	0.092
		High Development	0.181	0.204	0.011	0.796
Chestnut-sided Warbler	2013	Low Development	0.143	0.194	0.004	0.782
		BLM Reference	0.02	0.032	0.002	0.092
	2014	High Development	0.205	0.215	0.014	0.83
		Low Development	0.165	0.199	0.009	0.825
	2015	BLM Reference	0.021	0.035	0.002	0.093
		High Development	0.2	0.218	0.012	0.842
Common Yellowthroat	2016	Low Development	0.164	0.205	0.008	0.843
		BLM Reference	0.021	0.037	0.002	0.101
	2017	High Development	0.227	0.232	0.014	0.877
		Low Development	0.192	0.217	0.012	0.871
	2018	BLM Reference	0.021	0.039	0.002	0.096
		High Development	0.22	0.235	0.011	0.884
Black-headed Grosbeak	2010	Low Development	0.194	0.226	0.008	0.914
		BLM Reference	0.022	0.041	0.002	0.103
	2011	High Development	0.144	0.12	0.021	0.479
		Low Development	0.199	0.199	0.013	0.778
	2012	BLM Reference	0.09	0.033	0.04	0.167
		High Development	0.126	0.114	0.017	0.466

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2012	Low Development	0.202	0.198	0.016	0.789
		BLM Reference	0.078	0.026	0.037	0.138
	2013	High Development	0.136	0.108	0.027	0.443
		Low Development	0.238	0.206	0.028	0.826
	2014	BLM Reference	0.086	0.027	0.044	0.148
		High Development	0.143	0.115	0.027	0.461
		Low Development	0.244	0.202	0.037	0.815
Blue Grosbeak	2015	BLM Reference	0.077	0.025	0.038	0.133
		High Development	0.139	0.111	0.026	0.463
		Low Development	0.278	0.213	0.046	0.858
	2016	BLM Reference	0.087	0.032	0.038	0.163
		High Development	0.127	0.118	0.017	0.494
		Low Development	0.271	0.224	0.036	0.896
Blue Grosbeak	2010	BLM Reference	0.075	0.025	0.034	0.132
		High Development	0.144	0.126	0.022	0.51
		Low Development	0.267	0.238	0.028	0.916
	2011	BLM Reference	0.076	0.028	0.034	0.139
		High Development	0.112	0.16	0.003	0.644
		Low Development	0.076	0.147	0	0.561
Blue Grosbeak	2012	BLM Reference	0.014	0.026	0.001	0.074
		High Development	0.112	0.154	0.004	0.622

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2013	Low Development	0.085	0.16	0	0.636
		BLM Reference	0.013	0.025	0.001	0.072
	2014	High Development	0.119	0.161	0.004	0.634
		Low Development	0.082	0.155	0	0.622
	2015	BLM Reference	0.014	0.027	0.001	0.078
		High Development	0.126	0.165	0.004	0.659
		Low Development	0.09	0.166	0	0.658
Blue-gray Gnatcatcher	2016	BLM Reference	0.015	0.03	0.001	0.087
		High Development	0.134	0.174	0.004	0.686
		Low Development	0.097	0.175	0	0.688
	2010	BLM Reference	0.015	0.029	0.001	0.089
		High Development	0.152	0.184	0.005	0.708
		Low Development	0.106	0.188	0	0.755
Cactus Wren	2011	BLM Reference	0.015	0.033	0	0.097
		High Development	0.054	0.109	0	0.402
		Low Development	0.065	0.115	0.001	0.423
	2012	BLM Reference	0.017	0.029	0.001	0.094
		High Development	0.054	0.108	0	0.399
		Low Development	0.067	0.116	0.001	0.438
Canyon Towhee	2013	BLM Reference	0.017	0.031	0.001	0.096
		High Development	0.052	0.106	0	0.384
	2014	Low Development	0.071	0.122	0.001	0.462
		BLM Reference	0.018	0.032	0.001	0.098
Cassin's Vireo	2013	High Development	0.053	0.109	0	0.409

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Brewer's Blackbird</i>	2014	Low Development	0.074	0.12	0.002	0.445
		BLM Reference	0.018	0.033	0.001	0.102
	2015	High Development	0.054	0.11	0	0.41
		Low Development	0.082	0.13	0.002	0.477
	2016	BLM Reference	0.019	0.036	0.001	0.112
		High Development	0.058	0.119	0	0.438
		Low Development	0.1	0.146	0.002	0.562
<i>Blue Grosbeak</i>	2010	BLM Reference	0.02	0.039	0.001	0.119
		High Development	0.059	0.123	0	0.462
		Low Development	0.103	0.156	0.002	0.624
	2011	BLM Reference	0.021	0.043	0	0.135
		High Development	0.413	0.153	0.16	0.747
		Low Development	0.542	0.203	0.169	0.914
<i>Blue Jay</i>	2012	BLM Reference	0.181	0.055	0.09	0.307
		High Development	0.509	0.145	0.25	0.806
		Low Development	0.624	0.16	0.303	0.914
	2013	BLM Reference	0.209	0.051	0.124	0.319
		High Development	0.477	0.112	0.275	0.708
		Low Development	0.544	0.189	0.193	0.906
<i>Carolina Wren</i>	2014	BLM Reference	0.202	0.046	0.122	0.303
		High Development	0.403	0.119	0.191	0.654
		Low Development	0.595	0.129	0.348	0.844
	2015	BLM Reference	0.199	0.045	0.118	0.295
		High Development	0.5	0.112	0.299	0.734

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Brewer's Sparrow	2015	Low Development	0.642	0.121	0.403	0.87
		BLM Reference	0.217	0.061	0.113	0.349
	2016	High Development	0.441	0.124	0.224	0.703
		Low Development	0.679	0.106	0.462	0.875
	2010	BLM Reference	0.274	0.057	0.172	0.399
		High Development	0.479	0.13	0.249	0.749
		Low Development	0.589	0.146	0.318	0.878
Brewer's Sparrow	2011	BLM Reference	0.249	0.057	0.146	0.371
		High Development	0.952	0.035	0.86	0.994
		Low Development	0.93	0.062	0.758	0.994
	2012	BLM Reference	0.772	0.054	0.655	0.868
		High Development	0.955	0.035	0.862	0.994
		Low Development	0.947	0.042	0.835	0.995
Brewer's Sparrow	2013	BLM Reference	0.797	0.045	0.698	0.878
		High Development	0.957	0.028	0.886	0.992
		Low Development	0.961	0.033	0.876	0.996
	2014	BLM Reference	0.804	0.043	0.712	0.879
		High Development	0.96	0.027	0.89	0.993
		Low Development	0.959	0.029	0.885	0.994
Brewer's Sparrow	2015	BLM Reference	0.841	0.037	0.762	0.907
		High Development	0.97	0.021	0.916	0.995
	2015	Low Development	0.965	0.027	0.896	0.995
		BLM Reference	0.843	0.045	0.741	0.919

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Broad-tailed Hummingbird</i>	2016	Low Development	0.975	0.021	0.917	0.997
		BLM Reference	0.879	0.034	0.804	0.936
		High Development	0.975	0.02	0.921	0.997
	2010	Low Development	0.978	0.02	0.922	0.998
		BLM Reference	0.883	0.035	0.806	0.941
	2011	High Development	0.203	0.132	0.036	0.549
	2011	Low Development	0.102	0.085	0.011	0.322
		BLM Reference	0.067	0.078	0.006	0.297
		High Development	0.209	0.126	0.04	0.524
	2012	Low Development	0.106	0.073	0.017	0.288
		BLM Reference	0.071	0.079	0.007	0.297
		High Development	0.297	0.115	0.121	0.572
	2013	Low Development	0.124	0.071	0.027	0.298
		BLM Reference	0.076	0.082	0.008	0.314
		High Development	0.254	0.104	0.09	0.496
	2014	Low Development	0.195	0.08	0.075	0.382
		BLM Reference	0.081	0.086	0.008	0.33
		High Development	0.319	0.096	0.159	0.534
	2015	Low Development	0.213	0.078	0.089	0.393
		BLM Reference	0.109	0.11	0.011	0.416
		High Development	0.298	0.108	0.12	0.542
	2016	Low Development	0.241	0.086	0.101	0.437
		BLM Reference	0.095	0.1	0.01	0.381
		High Development	0.371	0.102	0.192	0.585

Common Name	Year	Contrast	Mean	SD	LCL	UCL	
Brown-headed Cowbird	2010	Low Development	0.258	0.092	0.107	0.46	
		BLM Reference	0.108	0.112	0.01	0.44	
	2011	High Development	0.628	0.121	0.387	0.854	
		Low Development	0.537	0.163	0.22	0.843	
	2012	BLM Reference	0.189	0.081	0.074	0.393	
		High Development	0.691	0.113	0.453	0.895	
		Low Development	0.638	0.134	0.365	0.89	
Bullock's Oriole	2013	BLM Reference	0.201	0.07	0.094	0.363	
		High Development	0.655	0.096	0.455	0.831	
		Low Development	0.674	0.132	0.408	0.923	
	2014	BLM Reference	0.257	0.072	0.141	0.419	
		High Development	0.695	0.091	0.509	0.86	
		Low Development	0.612	0.113	0.383	0.826	
Bullock's Oriole	2015	BLM Reference	0.221	0.065	0.114	0.366	
		High Development	0.652	0.09	0.466	0.817	
		Low Development	0.701	0.102	0.492	0.89	
	2016	BLM Reference	0.236	0.072	0.118	0.397	
		High Development	0.641	0.105	0.425	0.832	
		Low Development	0.658	0.114	0.429	0.866	
Bullock's Oriole	2010	BLM Reference	0.326	0.077	0.193	0.492	
		High Development	0.707	0.092	0.516	0.868	
		Low Development	0.703	0.12	0.459	0.915	
Bullock's Oriole		BLM Reference	0.288	0.086	0.15	0.489	
		High Development	0.137	0.172	0.004	0.681	

Common Name	Year	Contrast	Mean	SD	LCL	UCL
House Sparrow	2010	Low Development	0.096	0.193	0	0.827
		BLM Reference	0.036	0.054	0.002	0.193
	2011	High Development	0.16	0.183	0.006	0.705
		Low Development	0.098	0.197	0	0.844
	2012	BLM Reference	0.035	0.052	0.002	0.186
		High Development	0.136	0.175	0.004	0.693
Song Sparrow	2013	Low Development	0.103	0.203	0	0.872
		BLM Reference	0.038	0.056	0.002	0.209
	2014	High Development	0.137	0.181	0.004	0.711
		Low Development	0.105	0.206	0	0.888
	2015	BLM Reference	0.036	0.055	0.002	0.199
		High Development	0.138	0.184	0.004	0.716
Cassin's Finch	2016	Low Development	0.113	0.213	0	0.905
		BLM Reference	0.039	0.062	0.002	0.22
	2010	High Development	0.142	0.194	0.003	0.748
		Low Development	0.12	0.221	0	0.928
	2011	BLM Reference	0.039	0.062	0.002	0.232
		High Development	0.145	0.2	0.003	0.773
	2011	Low Development	0.13	0.233	0	0.939
		BLM Reference	0.041	0.068	0.001	0.24

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Blue Grosbeak</i>	2012	Low Development	0.431	0.183	0.141	0.839
		BLM Reference	0.034	0.029	0.006	0.109
	2013	High Development	0.151	0.077	0.047	0.343
		Low Development	0.331	0.17	0.092	0.765
	2014	BLM Reference	0.032	0.028	0.006	0.107
		High Development	0.177	0.082	0.06	0.378
<i>Chestnut-sided Warbler</i>	2015	Low Development	0.384	0.155	0.154	0.763
		BLM Reference	0.029	0.027	0.005	0.101
	2016	High Development	0.185	0.08	0.068	0.378
		Low Development	0.362	0.165	0.124	0.774
	2010	BLM Reference	0.029	0.03	0.004	0.108
		High Development	0.132	0.075	0.033	0.314
<i>Cedar Waxwing</i>	2011	Low Development	0.431	0.167	0.174	0.826
		BLM Reference	0.028	0.029	0.004	0.105
	2012	High Development	0.159	0.078	0.047	0.345
		Low Development	0.372	0.183	0.118	0.85
	2011	BLM Reference	0.028	0.032	0.003	0.112
		High Development	0.307	0.147	0.09	0.653
<i>Red-eyed Vireo</i>	2010	Low Development	0.175	0.125	0.024	0.502
		BLM Reference	0.283	0.066	0.167	0.426
	2012	High Development	0.341	0.124	0.148	0.625

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Antilocapra americanus</i>	2013	Low Development	0.227	0.105	0.07	0.468
		BLM Reference	0.331	0.059	0.226	0.452
	2013	High Development	0.419	0.13	0.204	0.705
		Low Development	0.29	0.095	0.13	0.497
	2014	BLM Reference	0.314	0.057	0.208	0.433
		High Development	0.371	0.118	0.179	0.639
<i>Cynomys ludovicianus</i>	2014	Low Development	0.38	0.107	0.198	0.609
		BLM Reference	0.37	0.078	0.234	0.535
	2015	High Development	0.395	0.126	0.181	0.668
		Low Development	0.426	0.119	0.219	0.686
	2016	BLM Reference	0.359	0.061	0.243	0.487
		High Development	0.4	0.139	0.173	0.716
<i>Chestnut-collared Longspur</i>	2010	Low Development	0.4	0.12	0.186	0.65
		BLM Reference	0.366	0.065	0.246	0.498
	2011	High Development	0.065	0.141	0	0.575
		Low Development	0.086	0.162	0	0.64
	2012	BLM Reference	0.032	0.032	0.004	0.114
		High Development	0.066	0.143	0	0.59
<i>Perognathus maniculatus</i>	2011	Low Development	0.089	0.168	0	0.662
		BLM Reference	0.027	0.028	0.003	0.096
	2012	High Development	0.064	0.139	0	0.567
		Low Development	0.094	0.175	0	0.689
	2013	BLM Reference	0.026	0.029	0.003	0.099
		High Development	0.066	0.145	0	0.612

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Chipping Sparrow	2014	Low Development	0.101	0.182	0	0.716
		BLM Reference	0.025	0.029	0.003	0.099
		High Development	0.066	0.145	0	0.597
	2015	Low Development	0.108	0.191	0	0.754
		BLM Reference	0.025	0.031	0.002	0.103
	2016	High Development	0.068	0.15	0	0.626
Chipping Sparrow	2010	Low Development	0.119	0.205	0	0.784
		BLM Reference	0.024	0.031	0.002	0.105
		High Development	0.071	0.156	0	0.649
	2011	Low Development	0.128	0.217	0	0.826
		BLM Reference	0.025	0.034	0.002	0.112
		High Development	0.062	0.053	0.008	0.2
Chipping Sparrow	2012	Low Development	0.102	0.201	0	0.832
		BLM Reference	0.012	0.009	0.002	0.036
		High Development	0.053	0.047	0.006	0.179
	2013	Low Development	0.104	0.203	0	0.835
		BLM Reference	0.011	0.008	0.002	0.032
		High Development	0.052	0.04	0.008	0.158
Chipping Sparrow	2014	Low Development	0.112	0.214	0	0.864
		BLM Reference	0.012	0.009	0.002	0.034
	2014	High Development	0.053	0.042	0.008	0.162
		Low Development	0.111	0.213	0	0.874

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Clay-colored Sparrow</i>	2015	Low Development	0.118	0.221	0	0.892
		BLM Reference	0.012	0.009	0.002	0.036
		High Development	0.055	0.048	0.007	0.185
	2016	Low Development	0.126	0.229	0	0.907
		BLM Reference	0.013	0.01	0.002	0.039
	2010	High Development	0.221	0.101	0.07	0.457
<i>Clay-colored Sparrow</i>	2011	Low Development	0.228	0.24	0.01	0.914
		BLM Reference	0.051	0.025	0.017	0.113
		High Development	0.277	0.119	0.1	0.563
	2012	Low Development	0.245	0.24	0.015	0.928
		BLM Reference	0.06	0.024	0.024	0.118
		High Development	0.211	0.08	0.088	0.396
<i>Clay-colored Sparrow</i>	2013	Low Development	0.265	0.251	0.018	0.946
		BLM Reference	0.064	0.024	0.027	0.122
		High Development	0.182	0.071	0.066	0.344
	2014	Low Development	0.311	0.241	0.044	0.943
		BLM Reference	0.067	0.025	0.031	0.127
		High Development	0.192	0.066	0.086	0.342
<i>Clay-colored Sparrow</i>	2015	Low Development	0.337	0.245	0.053	0.959
		BLM Reference	0.081	0.033	0.033	0.16
	2015	High Development	0.181	0.07	0.069	0.342

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Cliff Swallow	2016	Low Development	0.402	0.244	0.081	0.966
		BLM Reference	0.078	0.028	0.034	0.144
		High Development	0.198	0.079	0.075	0.378
	2010	Low Development	0.388	0.267	0.051	0.975
		BLM Reference	0.079	0.032	0.032	0.156
	2011	High Development	0.104	0.062	0.023	0.26
Cliff Swallow	2011	Low Development	0.257	0.24	0.012	0.883
		BLM Reference	0.082	0.035	0.031	0.169
		High Development	0.093	0.056	0.018	0.231
	2012	Low Development	0.275	0.24	0.019	0.888
		BLM Reference	0.087	0.033	0.037	0.164
		High Development	0.11	0.049	0.037	0.224
Cliff Swallow	2013	Low Development	0.291	0.248	0.02	0.908
		BLM Reference	0.078	0.029	0.034	0.144
		High Development	0.152	0.067	0.056	0.318
	2014	Low Development	0.346	0.241	0.05	0.914
		BLM Reference	0.079	0.03	0.035	0.149
		High Development	0.126	0.053	0.047	0.251
Cliff Swallow	2015	Low Development	0.385	0.249	0.06	0.93
		BLM Reference	0.127	0.053	0.053	0.262
		High Development	0.148	0.068	0.05	0.311
	2016	Low Development	0.446	0.248	0.085	0.949
		BLM Reference	0.09	0.034	0.039	0.168
		High Development	0.151	0.068	0.05	0.309

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Grackle	2010	Low Development	0.424	0.274	0.053	0.964
		BLM Reference	0.081	0.035	0.031	0.163
		High Development	0.053	0.105	0	0.378
		Low Development	0.087	0.179	0	0.741
	2011	BLM Reference	0.073	0.028	0.031	0.14
		High Development	0.054	0.105	0	0.379
		Low Development	0.089	0.183	0	0.78
	2012	BLM Reference	0.08	0.026	0.038	0.141
		High Development	0.053	0.104	0	0.366
Common Nighthawk	2013	Low Development	0.096	0.193	0	0.803
		BLM Reference	0.083	0.025	0.043	0.142
		High Development	0.054	0.108	0	0.378
	2014	Low Development	0.099	0.196	0	0.822
		BLM Reference	0.088	0.026	0.045	0.147
		High Development	0.056	0.112	0	0.397
	2015	Low Development	0.106	0.206	0	0.864
		BLM Reference	0.105	0.036	0.048	0.191
		High Development	0.059	0.12	0	0.424
	2016	Low Development	0.114	0.216	0	0.887
		BLM Reference	0.1	0.031	0.05	0.17
		High Development	0.061	0.125	0	0.462
	2010	Low Development	0.123	0.229	0	0.925
		BLM Reference	0.094	0.031	0.043	0.164
		High Development	0.154	0.114	0.026	0.459

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Poorwill	2010	Low Development	0.348	0.287	0.02	0.978
		BLM Reference	0.324	0.14	0.112	0.648
	2011	High Development	0.147	0.107	0.021	0.428
		Low Development	0.372	0.285	0.029	0.981
	2012	BLM Reference	0.341	0.126	0.147	0.633
		High Development	0.159	0.095	0.039	0.395
		Low Development	0.437	0.281	0.06	0.986
Common Nighthawk	2013	BLM Reference	0.393	0.117	0.204	0.657
		High Development	0.214	0.109	0.066	0.489
		Low Development	0.44	0.275	0.076	0.987
	2014	BLM Reference	0.448	0.11	0.261	0.683
		High Development	0.193	0.096	0.061	0.435
		Low Development	0.529	0.253	0.139	0.991
Common Gallinule	2015	BLM Reference	0.401	0.132	0.189	0.699
		High Development	0.247	0.103	0.09	0.485
		Low Development	0.533	0.261	0.138	0.994
	2016	BLM Reference	0.471	0.115	0.273	0.725
		High Development	0.296	0.121	0.109	0.581
		Low Development	0.572	0.262	0.142	0.996
Common Moorhen	2010	BLM Reference	0.464	0.138	0.233	0.765
		High Development	0.055	0.099	0	0.363
		Low Development	0.182	0.249	0.002	0.928
	2011	BLM Reference	0.015	0.026	0.001	0.085
Common Moorhen	2011	High Development	0.055	0.1	0	0.355

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Raven	2012	Low Development	0.195	0.256	0.002	0.938
		BLM Reference	0.015	0.025	0.001	0.082
	2013	High Development	0.053	0.095	0.001	0.361
		Low Development	0.213	0.268	0.002	0.954
	2014	BLM Reference	0.015	0.026	0.001	0.082
		High Development	0.055	0.101	0	0.381
		Low Development	0.227	0.27	0.004	0.954
Common Raven	2015	BLM Reference	0.015	0.027	0.001	0.089
		High Development	0.055	0.103	0	0.379
		Low Development	0.248	0.282	0.005	0.97
	2016	BLM Reference	0.016	0.029	0.001	0.095
		High Development	0.059	0.114	0	0.428
		Low Development	0.268	0.29	0.006	0.974
Common Raven	2010	BLM Reference	0.016	0.03	0.001	0.096
		High Development	0.06	0.117	0	0.433
		Low Development	0.307	0.303	0.007	0.984
	2011	BLM Reference	0.017	0.033	0.001	0.107
		High Development	0.17	0.157	0.021	0.637
		Low Development	0.154	0.189	0.006	0.765
Common Raven	2012	BLM Reference	0.104	0.042	0.042	0.201
		High Development	0.203	0.169	0.029	0.712
		Low Development	0.169	0.191	0.01	0.769
	2012	BLM Reference	0.118	0.045	0.052	0.228
		High Development	0.199	0.158	0.037	0.679

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Yellowthroat	2013	Low Development	0.182	0.198	0.011	0.798
		BLM Reference	0.122	0.045	0.055	0.229
	2014	High Development	0.179	0.163	0.027	0.673
		Low Development	0.215	0.199	0.026	0.818
	2015	BLM Reference	0.13	0.049	0.057	0.248
		High Development	0.196	0.169	0.032	0.715
		Low Development	0.263	0.209	0.041	0.854
Common Yellowthroat	2016	BLM Reference	0.143	0.063	0.052	0.297
		High Development	0.203	0.182	0.028	0.768
		Low Development	0.324	0.214	0.064	0.896
	2010	BLM Reference	0.191	0.069	0.088	0.353
		High Development	0.195	0.187	0.022	0.776
		Low Development	0.335	0.233	0.052	0.922
Common Yellowthroat	2011	BLM Reference	0.202	0.084	0.083	0.409
		High Development	0.155	0.154	0.014	0.622
		Low Development	0.081	0.091	0.006	0.333
	2012	BLM Reference	0.024	0.031	0.003	0.102
		High Development	0.145	0.156	0.011	0.625
		Low Development	0.102	0.096	0.012	0.361
Common Yellowthroat	2013	BLM Reference	0.025	0.031	0.003	0.099
		High Development	0.149	0.153	0.016	0.619
	2013	Low Development	0.115	0.107	0.014	0.421
		BLM Reference	0.025	0.031	0.003	0.098

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Dark-eyed Junco	2014	Low Development	0.096	0.087	0.015	0.331
		BLM Reference	0.027	0.033	0.004	0.105
	2015	High Development	0.173	0.168	0.019	0.663
		Low Development	0.105	0.096	0.015	0.369
	2016	BLM Reference	0.028	0.036	0.003	0.111
		High Development	0.168	0.176	0.014	0.701
Dark-eyed Junco	2010	Low Development	0.119	0.111	0.015	0.431
		BLM Reference	0.034	0.041	0.004	0.131
	2011	High Development	0.189	0.186	0.017	0.739
		Low Development	0.167	0.14	0.024	0.562
	2012	BLM Reference	0.032	0.041	0.004	0.128
		High Development	0.088	0.09	0.009	0.314
Dark-eyed Junco	2013	Low Development	0.244	0.254	0.005	0.897
		BLM Reference	0.06	0.072	0.006	0.27
	2014	High Development	0.063	0.084	0.004	0.267
		Low Development	0.213	0.253	0.004	0.905
	2015	BLM Reference	0.062	0.072	0.007	0.266
		High Development	0.056	0.078	0.005	0.241
Dark-eyed Junco	2016	Low Development	0.216	0.258	0.003	0.92
		BLM Reference	0.069	0.076	0.008	0.292
	2017	High Development	0.054	0.08	0.004	0.243
		Low Development	0.217	0.26	0.004	0.931
	2018	BLM Reference	0.069	0.076	0.007	0.289
		High Development	0.051	0.08	0.003	0.232

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Downy Woodpecker	2015	Low Development	0.223	0.269	0.003	0.942
		BLM Reference	0.074	0.085	0.007	0.328
	2016	High Development	0.049	0.085	0.002	0.259
		Low Development	0.228	0.279	0.003	0.954
	2010	BLM Reference	0.088	0.094	0.009	0.361
		High Development	0.048	0.086	0.002	0.256
		Low Development	0.236	0.289	0.002	0.968
Downy Woodpecker	2011	BLM Reference	0.085	0.097	0.007	0.372
		High Development	0.316	0.156	0.084	0.688
		Low Development	0.219	0.158	0.029	0.644
	2012	BLM Reference	0.232	0.091	0.099	0.454
		High Development	0.322	0.148	0.097	0.671
		Low Development	0.304	0.154	0.084	0.675
Downy Woodpecker	2013	BLM Reference	0.229	0.078	0.108	0.413
		High Development	0.364	0.123	0.159	0.638
		Low Development	0.294	0.149	0.081	0.656
	2014	BLM Reference	0.231	0.072	0.12	0.4
		High Development	0.406	0.125	0.196	0.686
		Low Development	0.351	0.139	0.135	0.673
Downy Woodpecker	2015	BLM Reference	0.214	0.069	0.105	0.369
		High Development	0.393	0.117	0.194	0.651
		Low Development	0.43	0.148	0.188	0.758
	2016	BLM Reference	0.262	0.089	0.126	0.476
		High Development	0.44	0.128	0.223	0.718

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Dusky Flycatcher	2016	Low Development	0.453	0.158	0.191	0.8
		BLM Reference	0.249	0.072	0.133	0.414
		High Development	0.406	0.126	0.195	0.688
	2010	Low Development	0.528	0.162	0.241	0.864
		BLM Reference	0.24	0.073	0.125	0.413
	2011	High Development	0.243	0.099	0.094	0.474
2012	2011	Low Development	0.094	0.104	0.006	0.384
		BLM Reference	0.137	0.05	0.06	0.255
		High Development	0.232	0.095	0.083	0.451
	2013	Low Development	0.096	0.095	0.009	0.356
		BLM Reference	0.125	0.038	0.063	0.209
		High Development	0.223	0.073	0.102	0.391
2014	2012	Low Development	0.136	0.119	0.017	0.47
		BLM Reference	0.123	0.037	0.063	0.205
		High Development	0.182	0.066	0.07	0.327
	2015	Low Development	0.127	0.097	0.025	0.387
		BLM Reference	0.121	0.035	0.063	0.199
		High Development	0.233	0.073	0.115	0.4
2016	2014	Low Development	0.144	0.105	0.03	0.431
		BLM Reference	0.144	0.044	0.072	0.243
		High Development	0.168	0.066	0.06	0.316
	2015	Low Development	0.146	0.115	0.025	0.467
		BLM Reference	0.13	0.036	0.069	0.211
		High Development	0.219	0.076	0.094	0.385

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Eastern Kingbird	2010	Low Development	0.201	0.14	0.04	0.585
		BLM Reference	0.119	0.037	0.058	0.2
		High Development	0.065	0.134	0	0.512
	2011	Low Development	0.162	0.233	0.001	0.877
		BLM Reference	0.016	0.033	0	0.09
	2012	High Development	0.064	0.135	0	0.519
Eurasian Collared-Dove	2013	Low Development	0.174	0.238	0.002	0.883
		BLM Reference	0.016	0.033	0	0.091
		High Development	0.063	0.133	0	0.511
	2014	Low Development	0.188	0.251	0.002	0.914
		BLM Reference	0.017	0.034	0	0.091
		High Development	0.065	0.139	0	0.533
Eurasian Collared-Dove	2015	Low Development	0.201	0.253	0.003	0.918
		BLM Reference	0.017	0.034	0	0.1
		High Development	0.065	0.137	0	0.534
	2016	Low Development	0.22	0.266	0.004	0.933
		BLM Reference	0.018	0.038	0	0.108
		High Development	0.067	0.143	0	0.555
Eurasian Collared-Dove	2010	Low Development	0.239	0.276	0.004	0.947
		BLM Reference	0.018	0.037	0	0.105
		High Development	0.068	0.145	0	0.572
Eurasian Collared-Dove	2010	Low Development	0.274	0.288	0.005	0.961
		BLM Reference	0.019	0.04	0	0.127
		High Development	0.059	0.114	0	0.43

Common Name	Year	Contrast	Mean	SD	LCL	UCL
European Starling	2010	Low Development	0.082	0.161	0	0.637
		BLM Reference	0.015	0.02	0.001	0.062
	2011	High Development	0.061	0.12	0	0.479
		Low Development	0.085	0.165	0	0.652
	2012	BLM Reference	0.015	0.02	0.001	0.059
		High Development	0.06	0.119	0	0.462
		Low Development	0.09	0.173	0	0.685
European Starling	2013	BLM Reference	0.015	0.022	0.001	0.06
		High Development	0.061	0.124	0	0.49
		Low Development	0.092	0.172	0	0.67
	2014	BLM Reference	0.016	0.023	0.001	0.062
		High Development	0.062	0.125	0	0.484
		Low Development	0.099	0.183	0	0.731
European Starling	2015	BLM Reference	0.017	0.029	0.001	0.068
		High Development	0.066	0.134	0	0.53
		Low Development	0.106	0.194	0	0.785
	2016	BLM Reference	0.019	0.031	0.001	0.077
		High Development	0.068	0.139	0	0.551
		Low Development	0.118	0.209	0	0.846
European Starling	2010	BLM Reference	0.019	0.033	0.001	0.08
		High Development	0.084	0.129	0.004	0.463
		Low Development	0.097	0.14	0.004	0.522
	2011	BLM Reference	0.029	0.031	0.004	0.108
European Starling	2011	High Development	0.088	0.131	0.004	0.497

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Red-tailed Hawk</i>	2012	Low Development	0.106	0.144	0.006	0.54
		BLM Reference	0.029	0.031	0.004	0.106
	2013	High Development	0.092	0.129	0.007	0.477
		Low Development	0.116	0.147	0.007	0.557
	2014	BLM Reference	0.033	0.034	0.005	0.123
		High Development	0.098	0.134	0.008	0.51
		Low Development	0.13	0.144	0.015	0.562
<i>Ferruginous Hawk</i>	2015	BLM Reference	0.03	0.032	0.005	0.117
		High Development	0.105	0.136	0.009	0.514
		Low Development	0.165	0.156	0.026	0.64
	2016	BLM Reference	0.031	0.035	0.004	0.125
		High Development	0.126	0.149	0.011	0.596
		Low Development	0.211	0.172	0.036	0.732
<i>Red-tailed Hawk</i>	2010	BLM Reference	0.035	0.039	0.005	0.137
		High Development	0.133	0.155	0.011	0.626
		Low Development	0.218	0.183	0.033	0.773
	2011	BLM Reference	0.035	0.041	0.004	0.145
		High Development	0.141	0.197	0.002	0.768
		Low Development	0.089	0.176	0	0.709
<i>Ferruginous Hawk</i>	2012	BLM Reference	0.028	0.038	0.002	0.137
		High Development	0.145	0.203	0.003	0.797
		Low Development	0.093	0.183	0	0.747
	2013	BLM Reference	0.028	0.037	0.002	0.132
		High Development	0.149	0.203	0.004	0.805

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2013	Low Development	0.1	0.193	0	0.784
		BLM Reference	0.03	0.038	0.002	0.14
	2013	High Development	0.156	0.211	0.004	0.817
		Low Development	0.101	0.192	0	0.794
	2014	BLM Reference	0.031	0.04	0.002	0.141
		High Development	0.162	0.215	0.004	0.833
Red-shouldered Hawk	2014	Low Development	0.109	0.203	0	0.824
		BLM Reference	0.034	0.046	0.002	0.162
	2015	High Development	0.185	0.227	0.004	0.86
		Low Development	0.117	0.214	0	0.864
	2016	BLM Reference	0.037	0.05	0.002	0.176
		High Development	0.179	0.231	0.003	0.87
Burrowing Owl	2016	Low Development	0.126	0.224	0	0.88
		BLM Reference	0.038	0.051	0.002	0.181
	2010	High Development	0.066	0.126	0.001	0.478
		Low Development	0.085	0.173	0	0.713
	2011	BLM Reference	0.036	0.046	0.002	0.171
		High Development	0.066	0.126	0.001	0.484
Golden Eagle	2011	Low Development	0.087	0.174	0	0.707
		BLM Reference	0.032	0.042	0.002	0.151
	2012	High Development	0.064	0.124	0.001	0.491
		Low Development	0.094	0.186	0	0.767
	2013	BLM Reference	0.032	0.042	0.002	0.151
		High Development	0.066	0.127	0.001	0.488

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Grasshopper Sparrow</i>	2014	Low Development	0.096	0.186	0	0.761
		BLM Reference	0.032	0.044	0.002	0.155
		High Development	0.068	0.131	0.001	0.52
	2015	Low Development	0.104	0.197	0	0.793
		BLM Reference	0.033	0.046	0.002	0.16
	2016	High Development	0.071	0.139	0	0.539
<i>Grasshopper Sparrow</i>	2010	Low Development	0.113	0.207	0	0.808
		BLM Reference	0.033	0.048	0.002	0.169
		High Development	0.073	0.144	0.001	0.566
	2011	Low Development	0.12	0.217	0	0.855
		BLM Reference	0.034	0.052	0.002	0.176
		High Development	0.064	0.131	0	0.491
<i>Grasshopper Sparrow</i>	2012	Low Development	0.061	0.121	0.001	0.454
		BLM Reference	0.014	0.015	0.001	0.056
		High Development	0.064	0.133	0	0.491
	2013	Low Development	0.064	0.129	0.001	0.499
		BLM Reference	0.013	0.014	0.001	0.049
		High Development	0.062	0.129	0.001	0.477
<i>Grasshopper Sparrow</i>	2014	Low Development	0.066	0.128	0.001	0.477
		BLM Reference	0.012	0.014	0.001	0.049
		High Development	0.063	0.133	0.001	0.51
	2015	Low Development	0.069	0.13	0.001	0.499
		BLM Reference	0.012	0.014	0.001	0.049
		High Development	0.065	0.135	0.001	0.541

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Gray Catbird	2015	Low Development	0.075	0.138	0.001	0.538
		BLM Reference	0.013	0.015	0.001	0.056
		High Development	0.067	0.141	0	0.574
	2016	Low Development	0.091	0.151	0.002	0.597
		BLM Reference	0.012	0.015	0.001	0.054
	2010	High Development	0.132	0.17	0.003	0.669
Gray Catbird	2011	Low Development	0.085	0.167	0	0.657
		BLM Reference	0.022	0.024	0.002	0.089
		High Development	0.133	0.172	0.003	0.668
	2012	Low Development	0.09	0.172	0	0.681
		BLM Reference	0.021	0.022	0.002	0.081
		High Development	0.132	0.169	0.004	0.658
Gray Catbird	2013	Low Development	0.092	0.176	0	0.691
		BLM Reference	0.024	0.024	0.003	0.091
		High Development	0.151	0.183	0.004	0.69
	2014	Low Development	0.096	0.179	0	0.7
		BLM Reference	0.021	0.021	0.002	0.081
		High Development	0.138	0.178	0.004	0.69
Gray Catbird	2015	Low Development	0.104	0.188	0	0.733
		BLM Reference	0.021	0.023	0.002	0.084
Gray Catbird	2015	High Development	0.146	0.19	0.003	0.726

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Gray Flycatcher	2016	Low Development	0.112	0.202	0	0.773
		BLM Reference	0.021	0.023	0.002	0.085
		High Development	0.15	0.197	0.003	0.751
	2010	Low Development	0.12	0.212	0	0.805
		BLM Reference	0.022	0.025	0.002	0.092
	2011	High Development	0.072	0.071	0.008	0.265
	2012	Low Development	0.05	0.052	0.003	0.192
		BLM Reference	0.013	0.01	0.002	0.037
		High Development	0.079	0.073	0.009	0.274
	2013	Low Development	0.054	0.046	0.006	0.178
		BLM Reference	0.013	0.009	0.002	0.036
		High Development	0.081	0.061	0.015	0.236
	2014	Low Development	0.073	0.053	0.011	0.206
		BLM Reference	0.014	0.009	0.003	0.037
		High Development	0.103	0.071	0.022	0.285
	2015	Low Development	0.067	0.04	0.016	0.168
		BLM Reference	0.015	0.009	0.003	0.038
		High Development	0.106	0.068	0.026	0.271
	2016	Low Development	0.089	0.048	0.023	0.208
		BLM Reference	0.016	0.011	0.003	0.045
	2016	High Development	0.117	0.076	0.026	0.302
		Low Development	0.121	0.063	0.036	0.274
		BLM Reference	0.021	0.013	0.004	0.053
		High Development	0.136	0.082	0.032	0.331

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Greater Sage-Grouse	2010	Low Development	0.129	0.066	0.035	0.286
		BLM Reference	0.021	0.014	0.004	0.056
	2010	High Development	0.323	0.255	0.027	0.923
		Low Development	0.277	0.253	0.017	0.93
	2011	BLM Reference	0.052	0.033	0.013	0.14
		High Development	0.333	0.256	0.028	0.923
2012	2011	Low Development	0.305	0.25	0.025	0.937
		BLM Reference	0.052	0.03	0.015	0.132
	2012	High Development	0.307	0.255	0.025	0.916
		Low Development	0.329	0.257	0.028	0.944
	2013	BLM Reference	0.045	0.024	0.014	0.105
		High Development	0.309	0.261	0.024	0.931
2014	2013	Low Development	0.408	0.237	0.083	0.947
		BLM Reference	0.046	0.024	0.015	0.105
	2014	High Development	0.313	0.263	0.025	0.932
		Low Development	0.474	0.23	0.129	0.963
	2015	BLM Reference	0.047	0.026	0.014	0.112
		High Development	0.315	0.271	0.02	0.941
2016	2015	Low Development	0.535	0.223	0.175	0.972
		BLM Reference	0.042	0.022	0.013	0.096
	2016	High Development	0.333	0.276	0.021	0.949
		Low Development	0.57	0.227	0.184	0.981
	2016	BLM Reference	0.046	0.024	0.014	0.105
Green-tailed Towhee	2010	High Development	0.605	0.102	0.395	0.792

Common Name	Year	Contrast	Mean	SD	LCL	UCL
	2011	Low Development	0.87	0.088	0.651	0.984
		BLM Reference	0.32	0.061	0.207	0.448
	2011	High Development	0.748	0.097	0.539	0.917
		Low Development	0.898	0.064	0.74	0.984
	2012	BLM Reference	0.345	0.058	0.237	0.464
		High Development	0.718	0.078	0.548	0.856
	2012	Low Development	0.817	0.092	0.605	0.952
		BLM Reference	0.3	0.052	0.202	0.404
	2013	High Development	0.785	0.07	0.634	0.907
		Low Development	0.917	0.044	0.811	0.979
	2013	BLM Reference	0.336	0.054	0.237	0.447
		High Development	0.786	0.068	0.634	0.898
	2014	Low Development	0.913	0.048	0.792	0.978
		BLM Reference	0.38	0.068	0.255	0.521
	2015	High Development	0.783	0.076	0.609	0.905
		Low Development	0.934	0.04	0.831	0.986
	2015	BLM Reference	0.336	0.057	0.23	0.453
		High Development	0.858	0.058	0.722	0.948
	2016	Low Development	0.951	0.033	0.866	0.992
		BLM Reference	0.374	0.06	0.26	0.494
Hairy Woodpecker	2010	High Development	0.049	0.093	0	0.341
		Low Development	0.08	0.163	0	0.665
		BLM Reference	0.034	0.049	0.002	0.172
	2011	High Development	0.05	0.095	0	0.336

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2012	Low Development	0.08	0.164	0	0.667
		BLM Reference	0.035	0.05	0.002	0.168
	2012	High Development	0.047	0.089	0	0.322
		Low Development	0.084	0.17	0	0.691
	2013	BLM Reference	0.036	0.053	0.002	0.174
		High Development	0.049	0.094	0	0.353
Burrowing Owl	2014	Low Development	0.087	0.173	0	0.688
		BLM Reference	0.038	0.056	0.002	0.193
	2014	High Development	0.05	0.097	0	0.348
		Low Development	0.093	0.182	0	0.74
	2015	BLM Reference	0.046	0.067	0.003	0.239
		High Development	0.053	0.105	0	0.377
Burrowing Owl	2016	Low Development	0.1	0.194	0	0.787
		BLM Reference	0.042	0.065	0.002	0.226
	2016	High Development	0.054	0.108	0	0.382
		Low Development	0.108	0.205	0	0.833
	2016	BLM Reference	0.045	0.072	0.002	0.236
		High Development	0.054	0.108	0	0.382
Horned Lark	2010	Low Development	0.54	0.148	0.254	0.815
		BLM Reference	0.805	0.049	0.699	0.89
		High Development	0.779	0.08	0.6	0.911
	2011	Low Development	0.54	0.148	0.254	0.815
		BLM Reference	0.765	0.092	0.554	0.911
		High Development	0.548	0.125	0.306	0.784
Horned Lark	2012	BLM Reference	0.805	0.044	0.711	0.883
		High Development	0.815	0.064	0.673	0.922

Common Name	Year	Contrast	Mean	SD	LCL	UCL
House Sparrow	2013	Low Development	0.718	0.116	0.483	0.928
		BLM Reference	0.802	0.043	0.711	0.876
	2014	High Development	0.766	0.074	0.596	0.887
		Low Development	0.388	0.095	0.205	0.575
	2015	BLM Reference	0.806	0.042	0.714	0.878
		High Development	0.794	0.066	0.644	0.901
		Low Development	0.405	0.095	0.221	0.594
House Finch	2016	BLM Reference	0.76	0.058	0.632	0.86
		High Development	0.825	0.068	0.673	0.936
		Low Development	0.529	0.104	0.334	0.735
	2010	BLM Reference	0.821	0.043	0.729	0.894
		High Development	0.815	0.069	0.66	0.926
		Low Development	0.384	0.098	0.201	0.58
2011	2011	BLM Reference	0.827	0.044	0.731	0.903
		High Development	0.053	0.097	0	0.366
		Low Development	0.066	0.136	0	0.524
	2012	BLM Reference	0.092	0.05	0.029	0.219
		High Development	0.055	0.106	0	0.402
		Low Development	0.067	0.137	0	0.522
2013	2013	BLM Reference	0.095	0.043	0.036	0.2
		High Development	0.052	0.097	0	0.36
		Low Development	0.071	0.144	0	0.546
	2014	BLM Reference	0.097	0.041	0.039	0.196
		High Development	0.053	0.103	0	0.389

Common Name	Year	Contrast	Mean	SD	LCL	UCL
House Wren	2014	Low Development	0.072	0.144	0	0.567
		BLM Reference	0.091	0.037	0.038	0.178
	2014	High Development	0.054	0.105	0	0.4
		Low Development	0.079	0.157	0	0.625
	2015	BLM Reference	0.109	0.044	0.044	0.218
		High Development	0.057	0.112	0	0.438
House Wren	2016	Low Development	0.086	0.165	0	0.649
		BLM Reference	0.116	0.044	0.052	0.219
	2016	High Development	0.06	0.12	0	0.477
		Low Development	0.094	0.176	0	0.699
	2010	BLM Reference	0.094	0.042	0.036	0.196
		High Development	0.062	0.116	0	0.438
House Wren	2011	Low Development	0.073	0.15	0	0.607
		BLM Reference	0.013	0.013	0.001	0.05
	2011	High Development	0.061	0.115	0	0.431
		Low Development	0.074	0.152	0	0.601
	2012	BLM Reference	0.013	0.012	0.002	0.048
		High Development	0.061	0.114	0	0.426
House Wren	2012	Low Development	0.082	0.163	0	0.666
		BLM Reference	0.012	0.011	0.001	0.044
	2013	High Development	0.062	0.116	0	0.44
		Low Development	0.081	0.161	0	0.663
	2013	BLM Reference	0.012	0.011	0.001	0.042
		High Development	0.062	0.118	0	0.441

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Juniper Titmouse	2015	Low Development	0.088	0.174	0	0.716
		BLM Reference	0.012	0.013	0.001	0.048
	2016	High Development	0.065	0.125	0	0.474
		Low Development	0.095	0.184	0	0.747
	2010	BLM Reference	0.012	0.013	0.001	0.047
		High Development	0.068	0.13	0	0.486
		Low Development	0.103	0.197	0	0.789
Juniper Titmouse	2011	BLM Reference	0.012	0.014	0.001	0.049
		High Development	0.172	0.199	0.008	0.77
		Low Development	0.201	0.24	0.003	0.865
	2012	BLM Reference	0.081	0.089	0.008	0.337
		High Development	0.181	0.203	0.009	0.797
		Low Development	0.205	0.243	0.003	0.879
Juniper Titmouse	2013	BLM Reference	0.08	0.089	0.009	0.342
		High Development	0.19	0.203	0.014	0.799
		Low Development	0.259	0.263	0.006	0.918
	2014	BLM Reference	0.077	0.089	0.008	0.332
		High Development	0.22	0.215	0.018	0.834
		Low Development	0.222	0.254	0.005	0.909
Juniper Titmouse	2015	BLM Reference	0.079	0.092	0.008	0.348
		High Development	0.215	0.215	0.017	0.838
	2015	Low Development	0.234	0.263	0.004	0.922
		BLM Reference	0.081	0.1	0.007	0.374
	2015	High Development	0.248	0.229	0.02	0.863

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Killdeer	2016	Low Development	0.247	0.275	0.004	0.94
		BLM Reference	0.088	0.106	0.008	0.409
		High Development	0.258	0.235	0.021	0.886
	2010	Low Development	0.262	0.286	0.003	0.959
		BLM Reference	0.086	0.111	0.006	0.417
	2011	High Development	0.289	0.178	0.059	0.747
Killdeer	2011	Low Development	0.074	0.145	0.001	0.57
		BLM Reference	0.256	0.143	0.071	0.622
		High Development	0.298	0.178	0.064	0.76
	2012	Low Development	0.073	0.144	0.001	0.569
		BLM Reference	0.251	0.141	0.074	0.615
		High Development	0.331	0.167	0.099	0.755
Killdeer	2013	Low Development	0.079	0.155	0.001	0.671
		BLM Reference	0.24	0.142	0.069	0.608
		High Development	0.313	0.177	0.083	0.779
	2014	Low Development	0.083	0.159	0.002	0.7
		BLM Reference	0.228	0.144	0.057	0.616
		High Development	0.297	0.177	0.077	0.765
Killdeer	2015	Low Development	0.097	0.17	0.003	0.764
		BLM Reference	0.249	0.156	0.061	0.644
		High Development	0.344	0.191	0.091	0.833
	2016	Low Development	0.096	0.178	0.002	0.814
		BLM Reference	0.242	0.158	0.053	0.662
		High Development	0.34	0.196	0.084	0.838

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Lark Bunting	2010	Low Development	0.106	0.189	0.002	0.859
		BLM Reference	0.232	0.167	0.044	0.673
	2010	High Development	0.098	0.144	0.002	0.545
		Low Development	0.153	0.221	0.002	0.848
	2011	BLM Reference	0.093	0.032	0.043	0.166
		High Development	0.104	0.147	0.002	0.574
Lark Sparrow	2011	Low Development	0.158	0.222	0.002	0.834
		BLM Reference	0.106	0.031	0.055	0.177
	2012	High Development	0.106	0.144	0.003	0.56
		Low Development	0.169	0.235	0.002	0.868
	2013	BLM Reference	0.103	0.029	0.054	0.166
		High Development	0.112	0.15	0.003	0.578
	2014	Low Development	0.178	0.238	0.003	0.881
		BLM Reference	0.137	0.035	0.078	0.216
	2015	High Development	0.118	0.154	0.003	0.596
		Low Development	0.203	0.251	0.004	0.902
	2016	BLM Reference	0.129	0.04	0.062	0.218
		High Development	0.129	0.168	0.003	0.652
	2010	Low Development	0.206	0.263	0.003	0.924
		BLM Reference	0.173	0.044	0.1	0.27
	2016	High Development	0.145	0.176	0.004	0.681
		Low Development	0.223	0.276	0.003	0.943
	2010	BLM Reference	0.167	0.046	0.091	0.271
		High Development	0.061	0.111	0.001	0.41

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2010	Low Development	0.127	0.227	0	0.9
		BLM Reference	0.033	0.058	0.001	0.2
	2011	High Development	0.062	0.111	0.001	0.419
		Low Development	0.133	0.234	0	0.912
	2012	BLM Reference	0.034	0.06	0.001	0.213
		High Development	0.059	0.105	0.001	0.379
Cassin's Vireo	2013	Low Development	0.138	0.241	0	0.935
		BLM Reference	0.036	0.063	0.002	0.227
	2014	High Development	0.06	0.109	0.001	0.401
		Low Development	0.144	0.247	0	0.94
	2015	BLM Reference	0.036	0.064	0.002	0.235
		High Development	0.061	0.112	0.001	0.415
Lazuli Bunting	2016	Low Development	0.153	0.256	0	0.952
		BLM Reference	0.044	0.076	0.002	0.274
	2010	High Development	0.064	0.12	0.001	0.444
		Low Development	0.163	0.265	0	0.966
	2011	BLM Reference	0.041	0.073	0.001	0.269
		High Development	0.065	0.122	0.001	0.455
	2011	Low Development	0.174	0.276	0	0.972
		BLM Reference	0.044	0.08	0.001	0.301
	2010	High Development	0.107	0.105	0.012	0.416
		Low Development	0.075	0.161	0	0.632
		BLM Reference	0.035	0.018	0.01	0.08
		High Development	0.109	0.103	0.013	0.4

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Cassin's Vireo	2010	Low Development	0.076	0.163	0	0.638
		BLM Reference	0.036	0.017	0.013	0.076
	2012	High Development	0.123	0.099	0.025	0.398
		Low Development	0.081	0.173	0	0.694
	2013	BLM Reference	0.038	0.017	0.014	0.078
		High Development	0.133	0.103	0.025	0.409
Warbling Vireo	2014	Low Development	0.084	0.175	0	0.697
		BLM Reference	0.038	0.017	0.015	0.078
	2015	High Development	0.131	0.101	0.03	0.406
		Low Development	0.091	0.185	0	0.753
	2016	BLM Reference	0.051	0.025	0.017	0.109
		High Development	0.138	0.109	0.027	0.44
Least Flycatcher	2010	Low Development	0.098	0.196	0	0.813
		BLM Reference	0.049	0.021	0.018	0.099
	2011	High Development	0.148	0.117	0.027	0.488
		Low Development	0.107	0.207	0	0.849
	2012	BLM Reference	0.051	0.024	0.017	0.108
		High Development	0.043	0.052	0.004	0.166
Blue Grosbeak	2010	Low Development	0.172	0.217	0.002	0.803
		BLM Reference	0.017	0.012	0.003	0.048
	2011	High Development	0.057	0.062	0.006	0.222
		Low Development	0.201	0.228	0.004	0.827
	2012	BLM Reference	0.017	0.011	0.004	0.044
		High Development	0.041	0.044	0.005	0.145

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2013	Low Development	0.177	0.227	0.002	0.831
		BLM Reference	0.019	0.011	0.005	0.046
	2014	High Development	0.042	0.046	0.005	0.154
		Low Development	0.179	0.223	0.003	0.821
	2015	BLM Reference	0.018	0.01	0.005	0.044
		High Development	0.042	0.046	0.005	0.152
		Low Development	0.186	0.235	0.003	0.844
Loggerhead Shrike	2016	BLM Reference	0.022	0.014	0.005	0.055
		High Development	0.044	0.051	0.004	0.173
		Low Development	0.193	0.243	0.003	0.867
	2010	BLM Reference	0.022	0.012	0.005	0.053
		High Development	0.051	0.059	0.005	0.199
		Low Development	0.202	0.256	0.002	0.903
Red-shouldered Hawk	2011	BLM Reference	0.023	0.014	0.005	0.058
		High Development	0.076	0.079	0.007	0.296
		Low Development	0.098	0.196	0	0.813
	2012	BLM Reference	0.141	0.075	0.042	0.328
		High Development	0.082	0.079	0.009	0.307
		Low Development	0.101	0.202	0	0.84
Burrowing Owl	2013	BLM Reference	0.159	0.07	0.06	0.33
		High Development	0.09	0.074	0.016	0.286
		Low Development	0.107	0.21	0	0.869
	2014	BLM Reference	0.139	0.061	0.054	0.29
		High Development	0.099	0.078	0.018	0.302

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2014	Low Development	0.11	0.214	0	0.89
		BLM Reference	0.139	0.058	0.057	0.279
	2014	High Development	0.112	0.078	0.025	0.32
		Low Development	0.117	0.224	0	0.911
	2015	BLM Reference	0.153	0.066	0.059	0.317
		High Development	0.21	0.103	0.064	0.458
Long-eared Owl	2016	Low Development	0.125	0.235	0	0.942
		BLM Reference	0.151	0.058	0.065	0.293
	2016	High Development	0.154	0.099	0.033	0.41
		Low Development	0.133	0.242	0	0.96
	2010	BLM Reference	0.153	0.055	0.067	0.286
		High Development	0.11	0.155	0.003	0.608
Burrowing Owl	2011	Low Development	0.097	0.187	0	0.769
		BLM Reference	0.089	0.031	0.039	0.16
	2011	High Development	0.113	0.159	0.003	0.637
		Low Development	0.1	0.191	0	0.768
	2012	BLM Reference	0.101	0.031	0.052	0.172
		High Development	0.114	0.158	0.004	0.627
Long-eared Owl	2012	Low Development	0.11	0.206	0	0.841
		BLM Reference	0.109	0.031	0.059	0.179
	2013	High Development	0.118	0.163	0.004	0.638
		Low Development	0.113	0.21	0	0.845
	2014	BLM Reference	0.1	0.028	0.053	0.164
		High Development	0.13	0.172	0.005	0.694

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>MacGillivray's Warbler</i>	2015	Low Development	0.121	0.221	0	0.879
		BLM Reference	0.142	0.046	0.07	0.249
		High Development	0.129	0.18	0.003	0.724
	2016	Low Development	0.13	0.232	0	0.896
		BLM Reference	0.105	0.032	0.054	0.176
	2010	High Development	0.136	0.187	0.003	0.757
<i>MacGillivray's Warbler</i>	2011	Low Development	0.141	0.245	0	0.927
		BLM Reference	0.105	0.035	0.049	0.187
		High Development	0.115	0.155	0.003	0.604
	2012	Low Development	0.174	0.238	0.002	0.865
		BLM Reference	0.046	0.058	0.003	0.206
		High Development	0.116	0.158	0.003	0.615
<i>MacGillivray's Warbler</i>	2013	Low Development	0.183	0.243	0.002	0.882
		BLM Reference	0.047	0.06	0.004	0.213
		High Development	0.115	0.155	0.004	0.619
	2014	Low Development	0.198	0.255	0.002	0.902
		BLM Reference	0.049	0.061	0.004	0.227
		High Development	0.131	0.167	0.005	0.658
<i>MacGillivray's Warbler</i>	2015	Low Development	0.21	0.257	0.004	0.9
		BLM Reference	0.055	0.067	0.005	0.248
	2015	High Development	0.122	0.165	0.004	0.65
		Low Development	0.226	0.267	0.004	0.921
		BLM Reference	0.062	0.078	0.005	0.286
		High Development	0.127	0.174	0.003	0.683

Common Name	Year	Contrast	Mean	SD	LCL	UCL
McCown's Longspur	2016	Low Development	0.257	0.276	0.005	0.936
		BLM Reference	0.058	0.076	0.004	0.277
		High Development	0.133	0.181	0.003	0.709
	2010	Low Development	0.263	0.287	0.004	0.954
		BLM Reference	0.062	0.082	0.004	0.301
	2011	High Development	0.066	0.131	0	0.518
2012	2011	Low Development	0.07	0.145	0	0.564
		BLM Reference	0.042	0.019	0.015	0.088
		High Development	0.066	0.132	0	0.52
	2013	Low Development	0.072	0.149	0	0.588
		BLM Reference	0.045	0.018	0.018	0.089
		High Development	0.065	0.132	0	0.521
2014	2012	Low Development	0.078	0.159	0	0.635
		BLM Reference	0.046	0.018	0.02	0.087
		High Development	0.066	0.135	0	0.527
	2015	Low Development	0.078	0.157	0	0.62
		BLM Reference	0.047	0.018	0.02	0.09
		High Development	0.068	0.139	0	0.556
2016	2014	Low Development	0.085	0.167	0	0.679
		BLM Reference	0.046	0.02	0.017	0.093
	2015	High Development	0.071	0.148	0	0.599
		Low Development	0.092	0.178	0	0.717
	2016	BLM Reference	0.05	0.02	0.02	0.098
	2016	High Development	0.073	0.15	0	0.604

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mountain Bluebird	2010	Low Development	0.1	0.189	0	0.772
		BLM Reference	0.05	0.021	0.018	0.101
		High Development	0.105	0.146	0.002	0.549
		Low Development	0.066	0.146	0	0.587
	2011	BLM Reference	0.052	0.024	0.019	0.109
		High Development	0.112	0.154	0.003	0.592
	2012	Low Development	0.069	0.15	0	0.618
		BLM Reference	0.042	0.018	0.016	0.085
		High Development	0.114	0.149	0.003	0.578
Mountain Chickadee	2013	Low Development	0.071	0.155	0	0.645
		BLM Reference	0.047	0.02	0.018	0.095
		High Development	0.122	0.157	0.003	0.592
	2014	Low Development	0.074	0.159	0	0.676
		BLM Reference	0.044	0.019	0.016	0.092
		High Development	0.13	0.164	0.004	0.636
	2015	Low Development	0.08	0.168	0	0.712
		BLM Reference	0.053	0.028	0.017	0.123
		High Development	0.139	0.175	0.003	0.677
Mountain Chickadee	2016	Low Development	0.088	0.18	0	0.758
		BLM Reference	0.045	0.023	0.013	0.103
		High Development	0.159	0.189	0.004	0.724
Mountain Chickadee	2010	Low Development	0.096	0.191	0	0.796
		BLM Reference	0.042	0.026	0.01	0.108
		High Development	0.055	0.105	0	0.397

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.182	0.237	0.002	0.873
		BLM Reference	0.024	0.017	0.005	0.066
	2011	High Development	0.056	0.11	0	0.414
		Low Development	0.19	0.238	0.003	0.878
	2012	BLM Reference	0.024	0.015	0.006	0.062
		High Development	0.055	0.107	0	0.394
		Low Development	0.202	0.249	0.003	0.9
Burrowing Owl	2013	BLM Reference	0.026	0.015	0.008	0.063
		High Development	0.057	0.116	0	0.434
		Low Development	0.21	0.246	0.004	0.891
	2014	BLM Reference	0.026	0.014	0.007	0.06
		High Development	0.058	0.119	0	0.441
		Low Development	0.242	0.258	0.005	0.912
Burrowing Owl	2015	BLM Reference	0.035	0.02	0.009	0.083
		High Development	0.061	0.126	0	0.475
		Low Development	0.243	0.268	0.004	0.931
	2016	BLM Reference	0.031	0.016	0.009	0.071
		High Development	0.064	0.134	0	0.529
		Low Development	0.261	0.281	0.004	0.948
Mountain Plover	2010	BLM Reference	0.031	0.017	0.008	0.072
		High Development	0.047	0.09	0	0.302
		Low Development	0.085	0.173	0	0.704
	2011	BLM Reference	0.021	0.016	0.004	0.061
		High Development	0.047	0.092	0	0.3

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mourning Dove	2012	Low Development	0.088	0.175	0	0.697
		BLM Reference	0.022	0.014	0.005	0.061
	2013	High Development	0.044	0.087	0	0.271
		Low Development	0.093	0.184	0	0.744
	2014	BLM Reference	0.021	0.013	0.005	0.053
		High Development	0.045	0.093	0	0.308
Mourning Dove	2015	Low Development	0.096	0.188	0	0.764
		BLM Reference	0.021	0.012	0.006	0.052
	2016	High Development	0.045	0.091	0	0.295
		Low Development	0.103	0.197	0	0.802
	2010	BLM Reference	0.025	0.016	0.006	0.068
		High Development	0.048	0.099	0	0.349
Mourning Dove	2011	Low Development	0.11	0.205	0	0.827
		BLM Reference	0.023	0.013	0.006	0.056
	2012	High Development	0.048	0.103	0	0.349
		Low Development	0.119	0.217	0	0.863
	2010	BLM Reference	0.027	0.016	0.006	0.068
		High Development	0.471	0.171	0.187	0.843
Mourning Dove	2011	Low Development	0.256	0.176	0.031	0.704
		BLM Reference	0.161	0.07	0.061	0.332
	2012	High Development	0.483	0.177	0.168	0.853
		Low Development	0.348	0.165	0.099	0.743
	2010	BLM Reference	0.175	0.061	0.083	0.32
		High Development	0.648	0.119	0.416	0.873

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2013	Low Development	0.379	0.175	0.114	0.789
		BLM Reference	0.207	0.059	0.112	0.342
	2014	High Development	0.737	0.097	0.54	0.91
		Low Development	0.386	0.134	0.167	0.685
	2015	BLM Reference	0.22	0.058	0.124	0.348
		High Development	0.738	0.094	0.541	0.904
		Low Development	0.457	0.125	0.233	0.718
Northern Flicker	2016	BLM Reference	0.192	0.062	0.088	0.33
		High Development	0.818	0.078	0.643	0.945
		Low Development	0.567	0.124	0.337	0.818
	2010	BLM Reference	0.267	0.061	0.16	0.4
		High Development	0.818	0.083	0.636	0.951
		Low Development	0.583	0.137	0.326	0.854
2011	2011	BLM Reference	0.295	0.076	0.167	0.458
		High Development	0.065	0.128	0	0.49
		Low Development	0.087	0.171	0	0.7
	2012	BLM Reference	0.053	0.04	0.012	0.159
		High Development	0.065	0.131	0	0.498
		Low Development	0.09	0.174	0	0.73
2013	2013	BLM Reference	0.06	0.039	0.016	0.166
		High Development	0.064	0.129	0	0.476
		Low Development	0.094	0.18	0	0.778
	2014	BLM Reference	0.06	0.038	0.017	0.16
		High Development	0.066	0.135	0	0.523

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Greater Prairie-Chicken</i>	2014	Low Development	0.093	0.177	0.001	0.776
		BLM Reference	0.069	0.041	0.022	0.177
	2014	High Development	0.066	0.136	0	0.516
		Low Development	0.099	0.184	0.001	0.805
	2015	BLM Reference	0.099	0.059	0.029	0.247
		High Development	0.07	0.143	0	0.553
<i>Northern Harrier</i>	2016	Low Development	0.108	0.194	0	0.839
		BLM Reference	0.089	0.053	0.026	0.223
		High Development	0.072	0.148	0	0.584
	2010	Low Development	0.117	0.205	0	0.868
		BLM Reference	0.092	0.057	0.023	0.24
		High Development	0.228	0.206	0.021	0.804
<i>Red-tailed Hawk</i>	2011	Low Development	0.182	0.244	0.002	0.918
		BLM Reference	0.063	0.076	0.005	0.284
		High Development	0.19	0.203	0.012	0.791
	2012	Low Development	0.19	0.248	0.003	0.929
		BLM Reference	0.06	0.073	0.005	0.284
		High Development	0.187	0.199	0.015	0.784
<i>Burrowing Owl</i>	2013	Low Development	0.202	0.259	0.003	0.951
		BLM Reference	0.062	0.076	0.006	0.294
		High Development	0.185	0.206	0.013	0.808
	2014	Low Development	0.214	0.263	0.005	0.942
		BLM Reference	0.063	0.078	0.006	0.298
		High Development	0.185	0.207	0.013	0.808

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Northern Rough-winged Swallow</i>	2015	Low Development	0.244	0.274	0.007	0.952
		BLM Reference	0.067	0.084	0.005	0.317
		High Development	0.2	0.216	0.012	0.843
	2016	Low Development	0.246	0.285	0.005	0.965
		BLM Reference	0.069	0.088	0.005	0.354
	2017	High Development	0.187	0.219	0.008	0.844
<i>Northern Rough-winged Swallow</i>	2010	Low Development	0.264	0.297	0.005	0.975
		BLM Reference	0.077	0.097	0.006	0.378
		High Development	0.239	0.131	0.062	0.572
	2011	Low Development	0.297	0.266	0.016	0.947
		BLM Reference	0.068	0.062	0.01	0.242
	2012	High Development	0.209	0.119	0.045	0.5
<i>Northern Rough-winged Swallow</i>	2012	Low Development	0.322	0.266	0.024	0.952
		BLM Reference	0.073	0.061	0.013	0.245
		High Development	0.295	0.105	0.13	0.536
	2013	Low Development	0.341	0.274	0.024	0.965
		BLM Reference	0.072	0.061	0.013	0.251
	2014	High Development	0.298	0.108	0.13	0.546
<i>Northern Rough-winged Swallow</i>	2013	Low Development	0.413	0.259	0.067	0.969
		BLM Reference	0.081	0.067	0.015	0.264
		High Development	0.282	0.098	0.125	0.505
	2014	Low Development	0.49	0.249	0.114	0.976
		BLM Reference	0.1	0.082	0.017	0.322
	2015	High Development	0.327	0.111	0.149	0.575

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Orange-crowned Warbler	2016	Low Development	0.492	0.266	0.096	0.983
		BLM Reference	0.091	0.077	0.015	0.308
		High Development	0.327	0.12	0.137	0.598
	2010	Low Development	0.535	0.27	0.101	0.988
		BLM Reference	0.094	0.085	0.013	0.337
	2011	High Development	0.263	0.18	0.045	0.738
2012	2011	Low Development	0.24	0.255	0.006	0.909
		BLM Reference	0.021	0.015	0.004	0.058
		High Development	0.238	0.176	0.036	0.725
	2013	Low Development	0.259	0.259	0.009	0.925
		BLM Reference	0.021	0.014	0.005	0.055
		High Development	0.272	0.165	0.069	0.702
2014	2012	Low Development	0.281	0.265	0.011	0.93
		BLM Reference	0.025	0.015	0.006	0.062
		High Development	0.26	0.17	0.058	0.727
	2015	Low Development	0.329	0.263	0.026	0.941
		BLM Reference	0.022	0.013	0.005	0.056
		High Development	0.27	0.169	0.069	0.729
2016	2014	Low Development	0.344	0.273	0.025	0.953
		BLM Reference	0.026	0.016	0.006	0.068
		High Development	0.263	0.18	0.054	0.759
	2015	Low Development	0.379	0.281	0.032	0.967
		BLM Reference	0.024	0.016	0.005	0.064
		High Development	0.261	0.185	0.053	0.788

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Pine Siskin	2010	Low Development	0.447	0.28	0.051	0.974
		BLM Reference	0.027	0.019	0.005	0.077
		High Development	0.051	0.092	0	0.346
	2011	Low Development	0.076	0.16	0	0.632
		BLM Reference	0.03	0.045	0.002	0.154
		High Development	0.051	0.096	0	0.359
	2012	Low Development	0.079	0.164	0	0.67
		BLM Reference	0.03	0.044	0.002	0.15
		High Development	0.05	0.092	0	0.355
Pinyon Jay	2013	Low Development	0.084	0.173	0	0.703
		BLM Reference	0.033	0.049	0.002	0.162
		High Development	0.052	0.098	0	0.382
	2014	Low Development	0.087	0.176	0	0.721
		BLM Reference	0.031	0.049	0.002	0.157
		High Development	0.053	0.103	0	0.395
	2015	Low Development	0.095	0.187	0	0.759
		BLM Reference	0.033	0.052	0.002	0.173
		High Development	0.057	0.112	0	0.43
Pinyon Jay	2016	Low Development	0.103	0.197	0	0.785
		BLM Reference	0.034	0.055	0.002	0.178
		High Development	0.059	0.116	0	0.459
Pinyon Jay	2010	Low Development	0.111	0.209	0	0.825
		BLM Reference	0.035	0.06	0.001	0.196
		High Development	0.063	0.129	0	0.491

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.098	0.195	0	0.796
		BLM Reference	0.065	0.027	0.024	0.131
	2011	High Development	0.065	0.135	0	0.532
		Low Development	0.103	0.201	0	0.83
	2012	BLM Reference	0.083	0.028	0.039	0.147
		High Development	0.062	0.128	0	0.496
		Low Development	0.11	0.209	0	0.852
Burrowing Owl	2013	BLM Reference	0.085	0.027	0.043	0.148
		High Development	0.063	0.13	0	0.506
		Low Development	0.112	0.211	0	0.853
	2014	BLM Reference	0.084	0.025	0.042	0.14
		High Development	0.064	0.133	0	0.504
		Low Development	0.12	0.22	0	0.88
Burrowing Owl	2015	BLM Reference	0.103	0.036	0.048	0.187
		High Development	0.067	0.139	0	0.543
		Low Development	0.129	0.229	0	0.901
	2016	BLM Reference	0.091	0.029	0.044	0.157
		High Development	0.069	0.143	0	0.552
		Low Development	0.138	0.241	0	0.924
Prairie Falcon	2010	BLM Reference	0.091	0.031	0.042	0.162
		High Development	0.072	0.149	0.001	0.594
		Low Development	0.226	0.262	0.004	0.942
	2011	BLM Reference	0.081	0.081	0.009	0.313
		High Development	0.074	0.155	0.001	0.65

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2012	Low Development	0.242	0.266	0.006	0.949
		BLM Reference	0.079	0.08	0.009	0.306
	2013	High Development	0.073	0.156	0.001	0.648
		Low Development	0.262	0.275	0.006	0.956
	2014	BLM Reference	0.078	0.083	0.008	0.313
		High Development	0.076	0.164	0.001	0.702
		Low Development	0.286	0.274	0.012	0.962
Red-tailed Hawk	2015	BLM Reference	0.074	0.082	0.006	0.317
		High Development	0.077	0.168	0.001	0.757
		Low Development	0.329	0.281	0.017	0.972
	2016	BLM Reference	0.074	0.086	0.005	0.327
		High Development	0.081	0.176	0	0.784
		Low Development	0.358	0.292	0.02	0.98
Red-tailed Hawk	2010	BLM Reference	0.075	0.088	0.005	0.338
		High Development	0.083	0.18	0	0.811
		Low Development	0.368	0.303	0.017	0.985
	2011	BLM Reference	0.076	0.096	0.004	0.366
		High Development	0.16	0.148	0.018	0.595
		Low Development	0.35	0.293	0.013	0.96
Red-tailed Hawk	2012	BLM Reference	0.05	0.066	0.004	0.233
		High Development	0.193	0.158	0.027	0.645
		Low Development	0.374	0.291	0.019	0.967
	2012	BLM Reference	0.053	0.068	0.005	0.243
		High Development	0.17	0.139	0.028	0.568

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Red-winged Blackbird</i>	2013	Low Development	0.444	0.292	0.036	0.974
		BLM Reference	0.051	0.068	0.005	0.233
	2014	High Development	0.197	0.149	0.035	0.612
		Low Development	0.439	0.291	0.041	0.972
	2015	BLM Reference	0.052	0.068	0.005	0.234
		High Development	0.198	0.149	0.038	0.613
		Low Development	0.491	0.289	0.059	0.978
<i>Red-winged Blackbird</i>	2016	BLM Reference	0.06	0.078	0.005	0.275
		High Development	0.234	0.163	0.043	0.666
		Low Development	0.525	0.29	0.063	0.985
	2010	BLM Reference	0.055	0.075	0.004	0.256
		High Development	0.212	0.169	0.029	0.673
		Low Development	0.559	0.291	0.071	0.989
<i>Red-winged Blackbird</i>	2011	BLM Reference	0.059	0.081	0.004	0.276
		High Development	0.229	0.139	0.047	0.581
		Low Development	0.473	0.285	0.048	0.98
	2012	BLM Reference	0.149	0.06	0.063	0.294
		High Development	0.264	0.142	0.068	0.618
		Low Development	0.527	0.265	0.093	0.984
<i>Red-winged Blackbird</i>	2013	BLM Reference	0.164	0.052	0.082	0.28
		High Development	0.212	0.11	0.063	0.487
	2013	Low Development	0.554	0.268	0.104	0.988
		BLM Reference	0.203	0.054	0.114	0.326

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Ring-necked Pheasant	2014	Low Development	0.585	0.25	0.147	0.989
		BLM Reference	0.208	0.053	0.119	0.327
	2015	High Development	0.198	0.104	0.061	0.472
		Low Development	0.648	0.226	0.21	0.992
	2016	BLM Reference	0.305	0.076	0.174	0.474
		High Development	0.202	0.119	0.052	0.519
		Low Development	0.644	0.246	0.174	0.994
Ring-necked Pheasant	2010	BLM Reference	0.291	0.074	0.166	0.458
		High Development	0.213	0.121	0.057	0.528
		Low Development	0.688	0.234	0.208	0.996
	2011	BLM Reference	0.295	0.091	0.147	0.501
		High Development	0.061	0.11	0	0.405
		Low Development	0.107	0.199	0	0.785
Ring-necked Pheasant	2012	BLM Reference	0.018	0.024	0.001	0.085
		High Development	0.064	0.117	0	0.45
		Low Development	0.111	0.204	0	0.806
	2013	BLM Reference	0.018	0.023	0.001	0.084
		High Development	0.061	0.108	0	0.409
		Low Development	0.119	0.215	0	0.841
Ring-necked Pheasant	2014	BLM Reference	0.019	0.025	0.002	0.085
		High Development	0.063	0.113	0	0.436
	2014	Low Development	0.123	0.218	0	0.838
		BLM Reference	0.02	0.026	0.002	0.092

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rock Pigeon	2015	Low Development	0.131	0.228	0	0.876
		BLM Reference	0.021	0.029	0.002	0.101
		High Development	0.069	0.124	0	0.484
	2016	Low Development	0.14	0.238	0	0.899
		BLM Reference	0.022	0.031	0.002	0.107
	2010	High Development	0.071	0.128	0	0.492
Rock Pigeon	2011	Low Development	0.151	0.249	0	0.921
		BLM Reference	0.025	0.036	0.002	0.12
		High Development	0.052	0.099	0	0.363
	2012	Low Development	0.071	0.149	0	0.59
		BLM Reference	0.088	0.11	0.009	0.419
		High Development	0.052	0.102	0	0.372
Rock Pigeon	2013	Low Development	0.072	0.151	0	0.615
		BLM Reference	0.083	0.109	0.009	0.389
		High Development	0.048	0.091	0	0.334
	2014	Low Development	0.079	0.163	0	0.677
		BLM Reference	0.085	0.113	0.009	0.402
		High Development	0.049	0.094	0	0.338
Rock Pigeon	2015	Low Development	0.079	0.16	0	0.665
		BLM Reference	0.092	0.119	0.01	0.451
	2015	High Development	0.05	0.098	0	0.362
		Low Development	0.086	0.172	0	0.714

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rock Wren	2016	Low Development	0.093	0.182	0	0.741
		BLM Reference	0.094	0.127	0.009	0.487
		High Development	0.054	0.108	0	0.41
	2010	Low Development	0.101	0.192	0	0.773
		BLM Reference	0.097	0.133	0.008	0.523
	2011	High Development	0.227	0.117	0.061	0.514
	2012	Low Development	0.088	0.076	0.009	0.295
		BLM Reference	0.452	0.071	0.317	0.597
		High Development	0.388	0.121	0.176	0.644
	2013	Low Development	0.114	0.076	0.02	0.305
		BLM Reference	0.476	0.062	0.359	0.596
		High Development	0.354	0.093	0.19	0.551
	2014	Low Development	0.088	0.065	0.012	0.25
		BLM Reference	0.473	0.061	0.357	0.598
		High Development	0.42	0.103	0.235	0.639
	2015	Low Development	0.125	0.06	0.038	0.27
		BLM Reference	0.457	0.06	0.342	0.579
		High Development	0.469	0.095	0.289	0.663
	2016	Low Development	0.189	0.083	0.069	0.39
		BLM Reference	0.46	0.069	0.325	0.597
	2015	High Development	0.501	0.105	0.305	0.712
		Low Development	0.194	0.09	0.062	0.413
	2016	BLM Reference	0.451	0.061	0.331	0.572
		High Development	0.479	0.113	0.271	0.707

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rufous Hummingbird	2010	Low Development	0.212	0.098	0.067	0.447
		BLM Reference	0.484	0.063	0.362	0.608
		High Development	0.077	0.054	0.014	0.218
	2011	Low Development	0.08	0.168	0	0.687
		BLM Reference	0.016	0.011	0.003	0.044
	2012	High Development	0.081	0.055	0.015	0.225
Sagebrush Sparrow	2013	Low Development	0.082	0.171	0	0.705
		BLM Reference	0.014	0.009	0.003	0.038
		High Development	0.061	0.035	0.015	0.148
	2014	Low Development	0.088	0.182	0	0.744
		BLM Reference	0.014	0.009	0.003	0.036
	2015	High Development	0.069	0.039	0.017	0.167
Sagebrush Sparrow	2016	Low Development	0.088	0.182	0	0.763
		BLM Reference	0.014	0.008	0.003	0.034
		High Development	0.06	0.034	0.016	0.145
	2017	Low Development	0.094	0.191	0	0.788
		BLM Reference	0.017	0.011	0.003	0.044
	2018	High Development	0.068	0.04	0.015	0.172
Sagebrush Sparrow	2019	Low Development	0.101	0.199	0	0.825
		BLM Reference	0.015	0.009	0.003	0.038
		High Development	0.068	0.042	0.014	0.174
	2020	Low Development	0.109	0.211	0	0.855
		BLM Reference	0.017	0.011	0.003	0.046
	2021	High Development	0.456	0.109	0.256	0.676

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Sage Thrasher	2010	Low Development	0.384	0.15	0.136	0.713
		BLM Reference	0.498	0.067	0.368	0.631
	2011	High Development	0.442	0.116	0.231	0.68
		Low Development	0.327	0.123	0.125	0.598
	2012	BLM Reference	0.474	0.061	0.359	0.597
		High Development	0.425	0.09	0.259	0.61
Sage Thrasher	2013	Low Development	0.304	0.124	0.107	0.594
		BLM Reference	0.449	0.058	0.334	0.565
	2014	High Development	0.325	0.09	0.156	0.506
		Low Development	0.21	0.075	0.084	0.373
	2015	BLM Reference	0.454	0.058	0.341	0.565
		High Development	0.395	0.086	0.236	0.572
Sage Thrasher	2016	Low Development	0.225	0.078	0.093	0.395
		BLM Reference	0.415	0.07	0.278	0.552
	2017	High Development	0.392	0.098	0.216	0.598
		Low Development	0.258	0.087	0.115	0.449
	2018	BLM Reference	0.506	0.061	0.385	0.628
		High Development	0.41	0.093	0.236	0.599
Sage Thrasher	2019	Low Development	0.214	0.081	0.085	0.393
		BLM Reference	0.532	0.061	0.412	0.65
	2020	High Development	0.753	0.085	0.565	0.897
		Low Development	0.497	0.151	0.214	0.786
Sage Thrasher	2021	BLM Reference	0.56	0.066	0.43	0.687
		High Development	0.767	0.092	0.563	0.92

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Savannah Sparrow	2012	Low Development	0.569	0.13	0.319	0.819
		BLM Reference	0.599	0.059	0.481	0.715
	2013	High Development	0.717	0.079	0.545	0.852
		Low Development	0.353	0.118	0.144	0.592
	2014	BLM Reference	0.612	0.057	0.498	0.72
		High Development	0.708	0.086	0.522	0.854
		Low Development	0.447	0.103	0.25	0.648
Savannah Sparrow	2015	BLM Reference	0.568	0.058	0.449	0.678
		High Development	0.719	0.077	0.557	0.855
		Low Development	0.484	0.099	0.293	0.678
	2016	BLM Reference	0.562	0.072	0.414	0.692
		High Development	0.718	0.084	0.538	0.866
		Low Development	0.487	0.103	0.289	0.695
Savannah Sparrow	2010	BLM Reference	0.639	0.059	0.518	0.748
		High Development	0.712	0.085	0.531	0.861
		Low Development	0.518	0.105	0.312	0.724
	2011	BLM Reference	0.689	0.056	0.574	0.793
		High Development	0.117	0.099	0.016	0.392
		Low Development	0.052	0.097	0.001	0.331
Savannah Sparrow	2012	BLM Reference	0.123	0.089	0.027	0.37
		High Development	0.093	0.079	0.011	0.307
	2012	Low Development	0.05	0.092	0.001	0.319
		BLM Reference	0.124	0.089	0.029	0.367
	2012	High Development	0.096	0.07	0.018	0.288

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Say's Phoebe	2013	Low Development	0.066	0.105	0.002	0.376
		BLM Reference	0.122	0.089	0.028	0.365
	2014	High Development	0.095	0.072	0.017	0.293
		Low Development	0.049	0.095	0.001	0.317
	2015	BLM Reference	0.121	0.09	0.028	0.369
		High Development	0.079	0.061	0.015	0.234
		Low Development	0.051	0.101	0.001	0.335
Say's Phoebe	2016	BLM Reference	0.118	0.099	0.022	0.397
		High Development	0.076	0.066	0.011	0.251
		Low Development	0.054	0.11	0.001	0.388
	2010	BLM Reference	0.109	0.095	0.019	0.385
		High Development	0.081	0.066	0.012	0.249
		Low Development	0.058	0.119	0.001	0.411
Say's Phoebe	2011	BLM Reference	0.109	0.102	0.016	0.412
		High Development	0.467	0.232	0.107	0.931
		Low Development	0.305	0.29	0.008	0.945
	2012	BLM Reference	0.172	0.058	0.08	0.305
		High Development	0.468	0.239	0.097	0.944
		Low Development	0.34	0.293	0.013	0.948
Say's Phoebe	2013	BLM Reference	0.156	0.051	0.075	0.271
		High Development	0.464	0.234	0.109	0.935
	2013	Low Development	0.353	0.302	0.013	0.962
		BLM Reference	0.156	0.05	0.077	0.271

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Greater Sage-Grouse	2013	Low Development	0.322	0.307	0.009	0.957
		BLM Reference	0.161	0.046	0.085	0.266
	2014	High Development	0.526	0.227	0.152	0.952
		Low Development	0.332	0.317	0.008	0.968
	2015	BLM Reference	0.184	0.066	0.082	0.339
		High Development	0.551	0.231	0.155	0.964
Sharp-tailed Grouse	2016	Low Development	0.341	0.327	0.007	0.975
		BLM Reference	0.184	0.061	0.091	0.325
	2017	High Development	0.516	0.255	0.104	0.968
		Low Development	0.352	0.336	0.005	0.981
	2018	BLM Reference	0.202	0.072	0.092	0.372
		High Development	0.139	0.193	0.004	0.792
Greater Prairie-Chicken	2010	Low Development	0.102	0.201	0	0.797
		BLM Reference	0.018	0.03	0.001	0.098
	2011	High Development	0.159	0.2	0.005	0.801
		Low Development	0.104	0.205	0	0.821
	2012	BLM Reference	0.018	0.029	0.001	0.101
		High Development	0.133	0.191	0.004	0.799
Spruce Grouse	2013	Low Development	0.111	0.214	0	0.851
		BLM Reference	0.018	0.029	0.001	0.102
	2014	High Development	0.133	0.195	0.004	0.829
		Low Development	0.112	0.217	0	0.864
	2015	BLM Reference	0.018	0.031	0.001	0.102
		High Development	0.134	0.197	0.003	0.833

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2015	Low Development	0.117	0.223	0	0.894
		BLM Reference	0.019	0.034	0.001	0.114
		High Development	0.136	0.203	0.003	0.84
	2016	Low Development	0.124	0.233	0	0.911
		BLM Reference	0.02	0.035	0.001	0.12
	2016	High Development	0.138	0.208	0.002	0.855
Short-eared Owl	2010	Low Development	0.131	0.241	0	0.928
		BLM Reference	0.02	0.038	0.001	0.13
		High Development	0.106	0.155	0.002	0.609
	2011	Low Development	0.088	0.17	0	0.67
		BLM Reference	0.023	0.035	0.001	0.116
		High Development	0.111	0.164	0.002	0.647
Red-tailed Hawk	2012	Low Development	0.089	0.167	0	0.647
		BLM Reference	0.024	0.035	0.001	0.116
		High Development	0.115	0.163	0.003	0.663
	2013	Low Development	0.096	0.179	0	0.702
		BLM Reference	0.025	0.036	0.001	0.119
		High Development	0.124	0.175	0.004	0.701
Prairie Falcon	2014	Low Development	0.099	0.183	0	0.721
		BLM Reference	0.026	0.037	0.001	0.127
		High Development	0.13	0.18	0.004	0.721
	2015	Low Development	0.107	0.193	0	0.741
		BLM Reference	0.028	0.042	0.001	0.134
		High Development	0.14	0.194	0.004	0.764

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Song Sparrow	2016	Low Development	0.116	0.208	0	0.805
		BLM Reference	0.03	0.043	0.001	0.145
		High Development	0.157	0.202	0.004	0.784
	2010	Low Development	0.126	0.221	0	0.849
		BLM Reference	0.034	0.048	0.001	0.165
	2011	High Development	0.201	0.114	0.049	0.487
Song Sparrow	2011	Low Development	0.067	0.145	0	0.564
		BLM Reference	0.07	0.033	0.025	0.149
		High Development	0.232	0.118	0.068	0.525
	2012	Low Development	0.069	0.147	0	0.57
		BLM Reference	0.075	0.028	0.033	0.142
		High Development	0.192	0.081	0.073	0.386
Song Sparrow	2013	Low Development	0.074	0.155	0	0.608
		BLM Reference	0.072	0.025	0.033	0.131
		High Development	0.163	0.069	0.056	0.321
	2014	Low Development	0.075	0.157	0	0.627
		BLM Reference	0.077	0.025	0.037	0.135
		High Development	0.174	0.065	0.073	0.324
Song Sparrow	2015	Low Development	0.081	0.167	0	0.659
		BLM Reference	0.085	0.032	0.037	0.161
		High Development	0.172	0.074	0.062	0.348
	2016	Low Development	0.089	0.179	0	0.736
		BLM Reference	0.08	0.027	0.037	0.142
		High Development	0.162	0.069	0.056	0.323

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Spotted Towhee	2010	Low Development	0.096	0.191	0	0.78
		BLM Reference	0.075	0.029	0.032	0.141
	2010	High Development	0.14	0.106	0.022	0.424
		Low Development	0.147	0.18	0.004	0.688
	2011	BLM Reference	0.042	0.03	0.009	0.124
		High Development	0.17	0.109	0.036	0.454
Swainson's Hawk	2011	Low Development	0.16	0.181	0.006	0.694
		BLM Reference	0.043	0.028	0.011	0.118
	2012	High Development	0.166	0.092	0.049	0.398
		Low Development	0.173	0.188	0.007	0.711
	2013	BLM Reference	0.053	0.031	0.016	0.134
		High Development	0.217	0.105	0.073	0.481
Swainson's Hawk	2014	Low Development	0.198	0.19	0.014	0.732
		BLM Reference	0.052	0.03	0.016	0.127
	2014	High Development	0.173	0.088	0.053	0.389
		Low Development	0.225	0.204	0.018	0.781
	2015	BLM Reference	0.062	0.041	0.016	0.17
		High Development	0.198	0.095	0.065	0.428
Swainson's Hawk	2016	Low Development	0.292	0.22	0.035	0.845
		BLM Reference	0.063	0.039	0.017	0.163
	2016	High Development	0.231	0.108	0.077	0.486
		Low Development	0.3	0.234	0.031	0.877
	2010	BLM Reference	0.072	0.046	0.019	0.188
		High Development	0.086	0.121	0.002	0.455

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Marmot	2010	Low Development	0.315	0.275	0.012	0.937
		BLM Reference	0.02	0.038	0	0.122
	2011	High Development	0.089	0.123	0.002	0.458
		Low Development	0.375	0.277	0.026	0.947
	2012	BLM Reference	0.02	0.038	0	0.125
		High Development	0.09	0.12	0.003	0.444
Yellow-bellied Marmot	2013	Low Development	0.348	0.288	0.016	0.958
		BLM Reference	0.02	0.037	0	0.122
	2014	High Development	0.096	0.128	0.003	0.471
		Low Development	0.383	0.283	0.027	0.957
	2015	BLM Reference	0.02	0.038	0	0.132
		High Development	0.102	0.133	0.003	0.494
American Pika	2016	Low Development	0.408	0.29	0.03	0.968
		BLM Reference	0.021	0.041	0	0.138
	2017	High Development	0.109	0.143	0.003	0.553
		Low Development	0.455	0.294	0.042	0.976
	2018	BLM Reference	0.021	0.04	0	0.14
		High Development	0.125	0.155	0.003	0.589
Townsend's Solitaire	2010	Low Development	0.476	0.3	0.043	0.983
		BLM Reference	0.022	0.043	0	0.146
	2011	High Development	0.188	0.218	0.008	0.823
		Low Development	0.305	0.292	0.008	0.953
Prairie Falcon	2011	BLM Reference	0.149	0.043	0.077	0.243
		High Development	0.192	0.22	0.008	0.822

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Bluebird	2012	Low Development	0.33	0.293	0.012	0.961
		BLM Reference	0.164	0.042	0.092	0.258
	2013	High Development	0.198	0.22	0.011	0.837
		Low Development	0.361	0.303	0.014	0.969
	2014	BLM Reference	0.145	0.037	0.082	0.229
		High Development	0.221	0.228	0.014	0.854
Brewer's Sparrow	2015	Low Development	0.394	0.299	0.026	0.968
		BLM Reference	0.155	0.042	0.086	0.245
	2016	High Development	0.219	0.229	0.013	0.861
		Low Development	0.443	0.297	0.039	0.976
	2017	BLM Reference	0.15	0.044	0.075	0.251
		High Development	0.217	0.237	0.01	0.881
Chipping Sparrow	2010	Low Development	0.473	0.299	0.046	0.981
		BLM Reference	0.165	0.043	0.092	0.259
	2011	High Development	0.228	0.245	0.01	0.895
		Low Development	0.508	0.301	0.05	0.988
	2012	BLM Reference	0.135	0.039	0.069	0.22
		High Development	0.146	0.177	0.006	0.696
Tree Swallow	2011	Low Development	0.068	0.138	0	0.547
		BLM Reference	0.119	0.072	0.033	0.305
		High Development	0.156	0.184	0.007	0.729
Towhee	2012	Low Development	0.069	0.141	0	0.572
		BLM Reference	0.129	0.068	0.041	0.301
		High Development	0.164	0.185	0.01	0.727

Common Name	Year	Contrast	Mean	SD	LCL	UCL
American Kestrel	2013	Low Development	0.075	0.149	0	0.59
		BLM Reference	0.142	0.071	0.051	0.322
	2013	High Development	0.177	0.193	0.01	0.771
		Low Development	0.077	0.152	0	0.6
	2014	BLM Reference	0.166	0.075	0.065	0.352
		High Development	0.191	0.2	0.012	0.792
Burrowing Owl	2014	Low Development	0.085	0.165	0	0.657
		BLM Reference	0.185	0.093	0.061	0.426
	2015	High Development	0.224	0.215	0.015	0.834
		Low Development	0.094	0.177	0	0.711
	2016	BLM Reference	0.175	0.089	0.058	0.4
		High Development	0.232	0.22	0.015	0.835
Burrowing Owl	2016	Low Development	0.103	0.19	0	0.752
		BLM Reference	0.18	0.102	0.051	0.44
	2010	High Development	0.134	0.072	0.036	0.312
		Low Development	0.122	0.22	0	0.861
	2011	BLM Reference	0.039	0.037	0.007	0.132
		High Development	0.111	0.07	0.021	0.282
Turkey Vulture	2011	Low Development	0.126	0.224	0	0.87
		BLM Reference	0.039	0.034	0.008	0.124
	2012	High Development	0.14	0.068	0.045	0.305
		Low Development	0.136	0.236	0	0.891
	2013	BLM Reference	0.043	0.037	0.009	0.133
		High Development	0.135	0.071	0.04	0.314

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Greater Prairie-Chicken</i>	2014	Low Development	0.14	0.24	0	0.898
		BLM Reference	0.042	0.036	0.009	0.134
	2014	High Development	0.139	0.074	0.041	0.328
		Low Development	0.15	0.251	0	0.914
	2015	BLM Reference	0.045	0.043	0.008	0.152
		High Development	0.131	0.086	0.028	0.358
<i>Upland Sandpiper</i>	2016	Low Development	0.16	0.263	0	0.933
		BLM Reference	0.041	0.04	0.007	0.141
	2016	High Development	0.167	0.101	0.039	0.425
		Low Development	0.169	0.273	0	0.948
	2010	BLM Reference	0.043	0.045	0.007	0.153
		High Development	0.05	0.101	0	0.366
<i>Greater Prairie-Chicken</i>	2011	Low Development	0.109	0.214	0	0.885
		BLM Reference	0.026	0.026	0.003	0.096
	2011	High Development	0.05	0.102	0	0.347
		Low Development	0.112	0.219	0	0.905
	2012	BLM Reference	0.026	0.025	0.003	0.094
		High Development	0.048	0.098	0	0.335
<i>Greater Prairie-Chicken</i>	2013	Low Development	0.12	0.229	0	0.92
		BLM Reference	0.028	0.026	0.004	0.099
	2013	High Development	0.048	0.099	0	0.333
		Low Development	0.124	0.234	0	0.924
	2014	BLM Reference	0.027	0.026	0.004	0.096
		High Development	0.05	0.104	0	0.379

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Vesper Sparrow	2015	Low Development	0.132	0.243	0	0.947
		BLM Reference	0.028	0.03	0.003	0.106
	2016	High Development	0.052	0.11	0	0.399
		Low Development	0.143	0.255	0	0.955
	2010	BLM Reference	0.029	0.03	0.003	0.108
		High Development	0.054	0.114	0	0.435
		Low Development	0.151	0.264	0	0.968
Vesper Sparrow	2011	BLM Reference	0.033	0.034	0.004	0.122
		High Development	0.95	0.039	0.851	0.994
		Low Development	0.954	0.049	0.819	0.998
	2012	BLM Reference	0.619	0.064	0.489	0.737
		High Development	0.956	0.035	0.861	0.995
		Low Development	0.964	0.036	0.868	0.998
Vesper Sparrow	2013	BLM Reference	0.653	0.056	0.538	0.758
		High Development	0.962	0.026	0.897	0.994
		Low Development	0.973	0.027	0.904	0.999
	2014	BLM Reference	0.687	0.053	0.58	0.787
		High Development	0.956	0.032	0.874	0.994
		Low Development	0.974	0.024	0.913	0.999
Vesper Sparrow	2015	BLM Reference	0.652	0.055	0.537	0.751
		High Development	0.971	0.021	0.917	0.996
	2015	Low Development	0.979	0.02	0.927	0.999
		BLM Reference	0.737	0.06	0.614	0.847
	2015	High Development	0.974	0.021	0.92	0.997

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Violet-green Swallow</i>	2016	Low Development	0.978	0.022	0.915	0.999
		BLM Reference	0.74	0.052	0.634	0.835
		High Development	0.976	0.021	0.919	0.998
	2010	Low Development	0.983	0.019	0.931	1
		BLM Reference	0.761	0.051	0.655	0.851
	2011	High Development	0.056	0.129	0	0.436
	2012	Low Development	0.18	0.236	0.002	0.885
		BLM Reference	0.032	0.049	0.002	0.164
		High Development	0.056	0.13	0	0.458
	2013	Low Development	0.192	0.242	0.003	0.894
		BLM Reference	0.032	0.048	0.002	0.164
		High Development	0.054	0.127	0.001	0.441
	2014	Low Development	0.207	0.254	0.003	0.917
		BLM Reference	0.033	0.049	0.002	0.169
		High Development	0.055	0.131	0	0.483
	2015	Low Development	0.217	0.256	0.005	0.916
		BLM Reference	0.034	0.05	0.002	0.178
		High Development	0.056	0.133	0.001	0.505
	2016	Low Development	0.249	0.271	0.006	0.933
		BLM Reference	0.041	0.059	0.002	0.211
	2015	High Development	0.058	0.137	0	0.513
		Low Development	0.252	0.283	0.004	0.946
		BLM Reference	0.037	0.055	0.002	0.199
	2016	High Development	0.059	0.138	0	0.533

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Warbling Vireo	2010	Low Development	0.272	0.296	0.004	0.963
		BLM Reference	0.039	0.06	0.002	0.221
	2010	High Development	0.102	0.082	0.015	0.325
		Low Development	0.106	0.206	0	0.857
	2011	BLM Reference	0.081	0.071	0.014	0.283
		High Development	0.086	0.072	0.011	0.275
Western Kingbird	2012	Low Development	0.108	0.209	0	0.874
		BLM Reference	0.084	0.07	0.017	0.284
	2012	High Development	0.084	0.057	0.019	0.23
		Low Development	0.115	0.217	0	0.915
	2013	BLM Reference	0.097	0.075	0.021	0.308
		High Development	0.095	0.064	0.022	0.262
	2014	Low Development	0.117	0.221	0	0.932
		BLM Reference	0.092	0.076	0.02	0.307
	2015	High Development	0.095	0.059	0.025	0.246
		Low Development	0.124	0.228	0	0.946
	2016	BLM Reference	0.128	0.097	0.029	0.405
		High Development	0.103	0.073	0.022	0.288
	2010	Low Development	0.133	0.239	0	0.96
		BLM Reference	0.115	0.092	0.025	0.382
	2016	High Development	0.1	0.068	0.021	0.271
		Low Development	0.142	0.25	0	0.969
	Western Kingbird	BLM Reference	0.112	0.099	0.021	0.403
		High Development	0.169	0.177	0.009	0.682

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.302	0.298	0.01	0.976
		BLM Reference	0.087	0.099	0.008	0.387
	2011	High Development	0.192	0.187	0.012	0.73
		Low Development	0.34	0.298	0.018	0.98
	2012	BLM Reference	0.096	0.102	0.01	0.404
		High Development	0.172	0.176	0.012	0.694
		Low Development	0.314	0.308	0.011	0.983
Burrowing Owl	2013	BLM Reference	0.089	0.1	0.009	0.403
		High Development	0.161	0.177	0.009	0.7
		Low Development	0.331	0.31	0.017	0.987
	2014	BLM Reference	0.091	0.103	0.009	0.411
		High Development	0.159	0.179	0.009	0.709
		Low Development	0.357	0.314	0.02	0.99
Burrowing Owl	2015	BLM Reference	0.093	0.111	0.008	0.433
		High Development	0.16	0.186	0.007	0.731
		Low Development	0.355	0.326	0.013	0.992
	2016	BLM Reference	0.101	0.116	0.009	0.457
		High Development	0.163	0.192	0.007	0.752
		Low Development	0.369	0.333	0.012	0.994
Western Meadowlark	2010	BLM Reference	0.1	0.121	0.007	0.475
		High Development	0.623	0.101	0.414	0.807
		Low Development	0.259	0.138	0.062	0.591
	2011	BLM Reference	0.251	0.055	0.152	0.366
		High Development	0.655	0.109	0.434	0.853

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mountain Bluebird	2012	Low Development	0.308	0.125	0.103	0.586
		BLM Reference	0.318	0.056	0.217	0.436
	2013	High Development	0.64	0.086	0.466	0.803
		Low Development	0.233	0.113	0.059	0.491
	2014	BLM Reference	0.306	0.053	0.21	0.417
		High Development	0.559	0.091	0.377	0.734
		Low Development	0.431	0.101	0.245	0.638
Blue Grosbeak	2015	BLM Reference	0.265	0.049	0.172	0.368
		High Development	0.507	0.089	0.331	0.678
		Low Development	0.558	0.1	0.363	0.758
	2016	BLM Reference	0.267	0.059	0.155	0.389
		High Development	0.515	0.097	0.322	0.702
		Low Development	0.564	0.102	0.358	0.755
Western Wood-Pewee	2010	BLM Reference	0.35	0.058	0.243	0.465
		High Development	0.495	0.1	0.304	0.694
		Low Development	0.658	0.1	0.45	0.835
	2011	BLM Reference	0.354	0.058	0.245	0.472
		High Development	0.135	0.174	0.004	0.663
		Low Development	0.102	0.195	0	0.777
Warbling Vireo	2012	BLM Reference	0.015	0.028	0.001	0.083
		High Development	0.118	0.169	0.003	0.645
		Low Development	0.103	0.194	0	0.791
	2012	BLM Reference	0.015	0.027	0.001	0.084
Chestnut-sided Warbler	2012	High Development	0.114	0.166	0.003	0.636

Common Name	Year	Contrast	Mean	SD	LCL	UCL
	2013	Low Development	0.111	0.205	0	0.812
		BLM Reference	0.015	0.027	0.001	0.083
	2013	High Development	0.113	0.17	0.003	0.658
		Low Development	0.115	0.212	0	0.834
	2014	BLM Reference	0.015	0.029	0.001	0.081
		High Development	0.112	0.17	0.002	0.658
	2014	Low Development	0.124	0.223	0	0.859
		BLM Reference	0.015	0.03	0.001	0.087
	2015	High Development	0.112	0.175	0.002	0.684
		Low Development	0.134	0.235	0	0.888
	2015	BLM Reference	0.015	0.03	0.001	0.087
		High Development	0.113	0.179	0.002	0.705
	2016	Low Development	0.144	0.246	0	0.911
		BLM Reference	0.016	0.033	0	0.093
	White-breasted Nuthatch	High Development	0.061	0.124	0	0.441
		Low Development	0.065	0.137	0	0.518
		BLM Reference	0.078	0.097	0.008	0.379
	2011	High Development	0.061	0.126	0	0.442
		Low Development	0.064	0.136	0	0.516
	2011	BLM Reference	0.083	0.099	0.009	0.387
		High Development	0.061	0.126	0	0.442
	2012	Low Development	0.064	0.136	0	0.516
		BLM Reference	0.083	0.099	0.009	0.387
	2012	High Development	0.059	0.122	0	0.403
		Low Development	0.069	0.141	0	0.544
	2013	BLM Reference	0.089	0.102	0.011	0.412
		High Development	0.06	0.125	0	0.44

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Wilson's Snipe	2014	Low Development	0.071	0.142	0	0.564
		BLM Reference	0.1	0.109	0.013	0.443
		High Development	0.061	0.127	0	0.446
	2015	Low Development	0.076	0.148	0	0.572
		BLM Reference	0.114	0.124	0.014	0.501
	2016	High Development	0.064	0.135	0	0.512
Wilson's Snipe	2010	Low Development	0.082	0.157	0	0.617
		BLM Reference	0.113	0.121	0.014	0.488
		High Development	0.065	0.137	0	0.506
	2011	Low Development	0.09	0.17	0	0.666
		BLM Reference	0.134	0.134	0.017	0.549
		High Development	0.177	0.202	0.01	0.794
Wilson's Snipe	2012	Low Development	0.09	0.174	0	0.693
		BLM Reference	0.046	0.037	0.01	0.145
		High Development	0.16	0.2	0.007	0.807
	2013	Low Development	0.094	0.179	0	0.724
		BLM Reference	0.048	0.034	0.012	0.133
		High Development	0.157	0.198	0.008	0.799
Wilson's Snipe	2014	Low Development	0.1	0.188	0	0.762
		BLM Reference	0.06	0.039	0.016	0.162
	2014	High Development	0.169	0.203	0.009	0.814
		Low Development	0.102	0.19	0	0.757

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Yellow Warbler	2015	Low Development	0.11	0.199	0	0.775
		BLM Reference	0.063	0.046	0.015	0.188
		High Development	0.157	0.211	0.005	0.82
	2016	Low Development	0.12	0.214	0	0.828
		BLM Reference	0.069	0.048	0.017	0.199
	2010	High Development	0.16	0.215	0.005	0.84
Yellow Warbler	2011	Low Development	0.129	0.226	0	0.868
		BLM Reference	0.066	0.052	0.014	0.209
		High Development	0.149	0.099	0.029	0.4
	2012	Low Development	0.081	0.139	0.001	0.541
		BLM Reference	0.042	0.021	0.013	0.094
		High Development	0.18	0.111	0.04	0.47
Yellow Warbler	2013	Low Development	0.08	0.137	0.001	0.537
		BLM Reference	0.041	0.018	0.015	0.083
		High Development	0.13	0.082	0.033	0.341
	2014	Low Development	0.106	0.158	0.002	0.63
		BLM Reference	0.05	0.019	0.02	0.094
		High Development	0.129	0.085	0.028	0.342
Yellow Warbler	2015	Low Development	0.084	0.142	0.002	0.572
		BLM Reference	0.054	0.02	0.023	0.1
		High Development	0.113	0.082	0.023	0.326
	2016	Low Development	0.089	0.151	0.002	0.616
		BLM Reference	0.062	0.027	0.024	0.128
		High Development	0.108	0.091	0.016	0.354

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Yellow-rumped Warbler	2016	Low Development	0.094	0.158	0.002	0.651
		BLM Reference	0.069	0.027	0.028	0.133
		High Development	0.12	0.099	0.018	0.394
	2010	Low Development	0.102	0.167	0.001	0.679
		BLM Reference	0.072	0.032	0.026	0.148
	2011	High Development	0.138	0.158	0.005	0.611
2012	2011	Low Development	0.081	0.152	0	0.583
		BLM Reference	0.015	0.024	0	0.078
		High Development	0.12	0.152	0.003	0.586
	2013	Low Development	0.084	0.156	0	0.606
		BLM Reference	0.015	0.025	0	0.081
		High Development	0.115	0.146	0.004	0.571
2014	2012	Low Development	0.091	0.169	0	0.673
		BLM Reference	0.015	0.025	0	0.082
		High Development	0.115	0.152	0.003	0.592
	2015	Low Development	0.092	0.167	0	0.646
		BLM Reference	0.016	0.027	0	0.082
		High Development	0.115	0.154	0.003	0.612
2016	2014	Low Development	0.099	0.178	0	0.709
		BLM Reference	0.017	0.03	0	0.097
	2015	High Development	0.117	0.162	0.002	0.644
		Low Development	0.109	0.191	0	0.744
	2016	BLM Reference	0.017	0.032	0	0.099
	2016	High Development	0.118	0.165	0.002	0.643

Common Name	Year	Contrast	Mean	SD	LCL	UCL
		Low Development	0.119	0.205	0	0.795
		BLM Reference	0.018	0.033	0	0.109

APPENDIX B. ESTIMATES OF SMALL-SCALE OCCUPANCY (MEAN), STANDARD DEVIATION (SD), AND LOWER (LCL) AND UPPER (UCL) 95% CREDIBLE LIMITS, RESPECTIVELY FOR ALL SPECIES DETECTED BY YEAR AND CONTRAST, WYOMING, 2010 – 2016.

Common Name	Year	Contrast	Mean	SD	LCL	UCL
American Crow	2010	High Development	0.035	0.032	0.005	0.125
		Low Development	0.083	0.098	0.004	0.371
		BLM Reference	0.066	0.067	0.005	0.254
	2011	High Development	0.024	0.024	0.003	0.092
		Low Development	0.075	0.059	0.009	0.227
		BLM Reference	0.053	0.051	0.006	0.192
	2012	High Development	0.023	0.021	0.004	0.081
		Low Development	0.092	0.091	0.007	0.342
		BLM Reference	0.052	0.047	0.006	0.183
	2013	High Development	0.021	0.02	0.003	0.074
		Low Development	0.099	0.083	0.011	0.321
		BLM Reference	0.053	0.055	0.004	0.201
	2014	High Development	0.019	0.019	0.003	0.07
		Low Development	0.113	0.089	0.013	0.348
		BLM Reference	0.054	0.044	0.007	0.17
	2015	High Development	0.02	0.022	0.002	0.083
		Low Development	0.128	0.087	0.017	0.344
		BLM Reference	0.06	0.048	0.007	0.184
	2016	High Development	0.019	0.021	0.002	0.078
		Low Development	0.17	0.127	0.017	0.494
		BLM Reference	0.054	0.048	0.005	0.181
American Goldfinch	2010	High Development	0.062	0.122	0	0.471

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.043	0.11	0	0.374
		BLM Reference	0.145	0.101	0.02	0.395
	2011	High Development	0.058	0.113	0	0.429
		Low Development	0.039	0.101	0	0.343
	2012	BLM Reference	0.08	0.068	0.01	0.263
		High Development	0.058	0.115	0	0.443
		Low Development	0.041	0.109	0	0.382
Burrowing Owl	2013	BLM Reference	0.075	0.063	0.01	0.245
		High Development	0.057	0.115	0	0.425
		Low Development	0.041	0.106	0	0.372
	2014	BLM Reference	0.069	0.074	0.005	0.274
		High Development	0.058	0.119	0	0.44
		Low Development	0.041	0.107	0	0.386
Burrowing Owl	2015	BLM Reference	0.062	0.058	0.006	0.218
		High Development	0.062	0.128	0	0.483
		Low Development	0.046	0.119	0	0.446
	2016	BLM Reference	0.062	0.071	0.004	0.263
		High Development	0.062	0.131	0	0.493
		Low Development	0.047	0.122	0	0.471
American Kestrel	2010	BLM Reference	0.062	0.084	0.003	0.314
		High Development	0.054	0.11	0	0.401
		Low Development	0.042	0.106	0	0.375
	2011	BLM Reference	0.064	0.068	0.006	0.252
		High Development	0.051	0.104	0	0.376

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2012	Low Development	0.038	0.096	0	0.322
		BLM Reference	0.067	0.038	0.016	0.162
	2013	High Development	0.049	0.103	0	0.371
		Low Development	0.041	0.104	0	0.367
	2014	BLM Reference	0.074	0.044	0.017	0.186
		High Development	0.051	0.108	0	0.389
		Low Development	0.04	0.104	0	0.396
Brewer's Sparrow	2015	BLM Reference	0.081	0.065	0.012	0.253
		High Development	0.051	0.109	0	0.406
		Low Development	0.041	0.106	0	0.388
	2016	BLM Reference	0.086	0.051	0.02	0.209
		High Development	0.054	0.119	0	0.456
		Low Development	0.045	0.117	0	0.443
American Robin	2010	BLM Reference	0.099	0.06	0.022	0.249
		High Development	0.055	0.121	0	0.458
		Low Development	0.046	0.119	0	0.435
	2011	BLM Reference	0.185	0.104	0.039	0.437
		High Development	0.114	0.084	0.017	0.339
		Low Development	0.07	0.071	0.007	0.259
2012	2011	BLM Reference	0.297	0.115	0.133	0.582
		High Development	0.158	0.042	0.085	0.249
		Low Development	0.11	0.046	0.043	0.218
	2012	BLM Reference	0.286	0.048	0.197	0.386
		High Development	0.158	0.046	0.079	0.259

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Blue Grosbeak</i>	2013	Low Development	0.072	0.038	0.021	0.169
		BLM Reference	0.263	0.047	0.176	0.36
	2014	High Development	0.217	0.054	0.124	0.336
		Low Development	0.087	0.029	0.041	0.153
	2015	BLM Reference	0.296	0.048	0.21	0.394
		High Development	0.209	0.066	0.096	0.356
		Low Development	0.111	0.032	0.061	0.184
<i>Ash-throated Flycatcher</i>	2016	BLM Reference	0.257	0.053	0.169	0.377
		High Development	0.262	0.07	0.142	0.417
		Low Development	0.1	0.033	0.05	0.176
	2010	BLM Reference	0.306	0.056	0.213	0.431
		High Development	0.306	0.06	0.197	0.431
		Low Development	0.202	0.04	0.13	0.287
<i>Blue Grosbeak</i>	2011	BLM Reference	0.329	0.07	0.202	0.475
		High Development	0.035	0.063	0.001	0.213
		Low Development	0.024	0.048	0	0.148
	2012	BLM Reference	0.081	0.142	0.001	0.545
		High Development	0.032	0.052	0.001	0.175
		Low Development	0.019	0.031	0.001	0.104
<i>Ash-throated Flycatcher</i>	2013	BLM Reference	0.075	0.13	0.001	0.518
		High Development	0.03	0.049	0.001	0.165
		Low Development	0.019	0.034	0.001	0.11
	2014	BLM Reference	0.075	0.132	0.001	0.512
		High Development	0.03	0.047	0.001	0.162

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Bank Swallow	2014	Low Development	0.019	0.026	0.001	0.092
		BLM Reference	0.079	0.142	0.001	0.561
	2015	High Development	0.029	0.046	0.001	0.157
		Low Development	0.018	0.027	0.001	0.092
Bank Swallow	2016	BLM Reference	0.079	0.144	0.001	0.565
		High Development	0.031	0.043	0.001	0.153
	2017	Low Development	0.019	0.033	0.001	0.108
		BLM Reference	0.08	0.147	0.001	0.573
Bank Swallow	2018	High Development	0.031	0.051	0.001	0.176
		Low Development	0.02	0.028	0.001	0.099
	2019	BLM Reference	0.087	0.161	0	0.637
		High Development	0.039	0.071	0.001	0.247
Bank Swallow	2020	Low Development	0.044	0.11	0	0.402
		BLM Reference	0.078	0.134	0.001	0.504
	2021	High Development	0.035	0.057	0.001	0.196
		Low Development	0.04	0.1	0	0.342
Bank Swallow	2022	BLM Reference	0.071	0.124	0.001	0.468
		High Development	0.033	0.052	0.001	0.178
	2023	Low Development	0.043	0.109	0	0.395
		BLM Reference	0.071	0.126	0.001	0.475
Bank Swallow	2024	High Development	0.033	0.052	0.001	0.179
		Low Development	0.042	0.108	0	0.392
	2025	BLM Reference	0.074	0.135	0.001	0.529
		High Development	0.033	0.051	0.001	0.184

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Barn Swallow	2015	Low Development	0.042	0.11	0	0.404
		BLM Reference	0.075	0.137	0.001	0.516
		High Development	0.034	0.048	0.001	0.163
	2016	Low Development	0.045	0.119	0	0.431
		BLM Reference	0.077	0.145	0.001	0.569
	2010	High Development	0.306	0.112	0.126	0.552
Barn Swallow	2011	Low Development	0.028	0.054	0.001	0.177
		BLM Reference	0.019	0.026	0.002	0.078
		High Development	0.136	0.072	0.035	0.309
	2012	Low Development	0.024	0.034	0.001	0.119
		BLM Reference	0.022	0.018	0.004	0.068
		High Development	0.099	0.054	0.026	0.231
Barn Swallow	2013	Low Development	0.023	0.031	0.001	0.11
		BLM Reference	0.024	0.017	0.006	0.068
		High Development	0.093	0.061	0.019	0.25
	2014	Low Development	0.021	0.04	0.001	0.124
		BLM Reference	0.017	0.016	0.003	0.062
		High Development	0.078	0.051	0.016	0.209
Barn Swallow	2015	Low Development	0.021	0.041	0.001	0.122
		BLM Reference	0.016	0.016	0.002	0.059
Barn Swallow	2015	High Development	0.074	0.07	0.008	0.27

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Bewick's Wren</i>	2016	Low Development	0.023	0.05	0	0.166
		BLM Reference	0.016	0.016	0.002	0.061
		High Development	0.067	0.057	0.008	0.225
	2010	Low Development	0.023	0.049	0	0.151
		BLM Reference	0.016	0.02	0.002	0.068
	2011	High Development	0.025	0.026	0.003	0.093
<i>Bewick's Wren</i>	2011	Low Development	0.02	0.032	0.001	0.092
		BLM Reference	0.032	0.031	0.004	0.12
		High Development	0.029	0.019	0.007	0.079
	2012	Low Development	0.016	0.018	0.002	0.065
		BLM Reference	0.023	0.019	0.004	0.073
		High Development	0.031	0.019	0.008	0.079
<i>Bewick's Wren</i>	2013	Low Development	0.02	0.017	0.003	0.066
		BLM Reference	0.023	0.018	0.004	0.073
		High Development	0.025	0.018	0.006	0.072
	2014	Low Development	0.017	0.016	0.003	0.059
		BLM Reference	0.022	0.019	0.003	0.073
		High Development	0.026	0.018	0.007	0.072
<i>Bewick's Wren</i>	2015	Low Development	0.017	0.015	0.003	0.057
		BLM Reference	0.022	0.018	0.004	0.071
		High Development	0.041	0.021	0.013	0.096
	2016	Low Development	0.015	0.016	0.002	0.059
		BLM Reference	0.023	0.018	0.004	0.069
	2016	High Development	0.027	0.021	0.006	0.082

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Black-billed Magpie	2010	Low Development	0.015	0.017	0.002	0.059
		BLM Reference	0.023	0.021	0.003	0.079
	2011	High Development	0.136	0.105	0.018	0.408
		Low Development	0.096	0.058	0.022	0.244
	2012	BLM Reference	0.088	0.045	0.026	0.198
		High Development	0.181	0.061	0.078	0.315
Black-capped Chickadee	2013	Low Development	0.101	0.036	0.046	0.185
		BLM Reference	0.095	0.032	0.044	0.169
	2014	High Development	0.13	0.059	0.045	0.271
		Low Development	0.067	0.036	0.019	0.154
	2015	BLM Reference	0.087	0.033	0.038	0.165
		High Development	0.104	0.045	0.037	0.209
	2016	Low Development	0.13	0.033	0.074	0.203
		BLM Reference	0.063	0.036	0.016	0.152
	2017	High Development	0.103	0.046	0.034	0.214
		Low Development	0.11	0.032	0.058	0.184
	2018	BLM Reference	0.127	0.052	0.053	0.253
		High Development	0.186	0.039	0.118	0.269
	2019	Low Development	0.286	0.05	0.195	0.39
		BLM Reference	0.103	0.028	0.055	0.166
	2020	High Development	0.108	0.053	0.032	0.233
		Low Development	0.117	0.034	0.063	0.198
	2021	BLM Reference	0.127	0.039	0.067	0.219
		High Development	0.031	0.051	0.001	0.177

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2010	Low Development	0.048	0.076	0.001	0.26
		BLM Reference	0.087	0.108	0.003	0.411
	2011	High Development	0.028	0.038	0.001	0.131
		Low Development	0.04	0.048	0.002	0.177
	2012	BLM Reference	0.078	0.081	0.005	0.305
		High Development	0.027	0.034	0.001	0.13
Chestnut-sided Warbler	2013	Low Development	0.043	0.058	0.002	0.204
		BLM Reference	0.078	0.08	0.005	0.306
	2014	High Development	0.027	0.031	0.002	0.117
		Low Development	0.04	0.039	0.003	0.146
	2015	BLM Reference	0.083	0.068	0.007	0.261
		High Development	0.027	0.035	0.001	0.125
Common Yellowthroat	2016	Low Development	0.043	0.049	0.002	0.175
		BLM Reference	0.081	0.09	0.004	0.35
	2017	High Development	0.031	0.04	0.001	0.142
		Low Development	0.063	0.062	0.004	0.235
	2018	BLM Reference	0.083	0.095	0.004	0.35
		High Development	0.029	0.041	0.001	0.148
Black-headed Grosbeak	2010	Low Development	0.051	0.064	0.002	0.238
		BLM Reference	0.091	0.117	0.002	0.449
	2011	High Development	0.082	0.067	0.009	0.257
		Low Development	0.062	0.084	0.003	0.305
Blue-gray Gnatcatcher	2011	BLM Reference	0.378	0.088	0.227	0.577
		High Development	0.077	0.063	0.01	0.246

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2010	Low Development	0.055	0.053	0.005	0.203
		BLM Reference	0.359	0.084	0.209	0.536
	2012	High Development	0.072	0.048	0.012	0.191
		Low Development	0.056	0.052	0.006	0.197
	2013	BLM Reference	0.295	0.055	0.191	0.405
		High Development	0.078	0.053	0.012	0.213
Blue Grosbeak	2014	Low Development	0.055	0.046	0.007	0.179
		BLM Reference	0.297	0.113	0.114	0.554
	2015	High Development	0.089	0.058	0.015	0.234
		Low Development	0.069	0.05	0.01	0.194
	2016	BLM Reference	0.354	0.09	0.199	0.555
		High Development	0.075	0.071	0.007	0.272
Blue Grosbeak	2010	Low Development	0.053	0.048	0.005	0.183
		BLM Reference	0.536	0.08	0.381	0.691
	2011	High Development	0.071	0.052	0.01	0.206
		Low Development	0.061	0.065	0.005	0.245
	2012	BLM Reference	0.611	0.074	0.464	0.757
		High Development	0.036	0.062	0.001	0.204
Blue Grosbeak	2010	Low Development	0.041	0.104	0	0.36
		BLM Reference	0.089	0.145	0.001	0.56
	2011	High Development	0.032	0.051	0.001	0.18
		Low Development	0.036	0.093	0	0.318
	2012	BLM Reference	0.082	0.132	0.001	0.502
		High Development	0.03	0.045	0.001	0.161

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2013	Low Development	0.038	0.1	0	0.345
		BLM Reference	0.083	0.136	0.001	0.531
	2013	High Development	0.03	0.044	0.001	0.155
		Low Development	0.037	0.097	0	0.343
	2014	BLM Reference	0.087	0.145	0.001	0.555
		High Development	0.029	0.043	0.001	0.149
Blue-gray Gnatcatcher	2015	Low Development	0.039	0.102	0	0.343
		BLM Reference	0.086	0.145	0.001	0.575
	2015	High Development	0.031	0.048	0.001	0.169
		Low Development	0.044	0.115	0	0.425
	2016	BLM Reference	0.088	0.151	0.001	0.588
		High Development	0.03	0.041	0.001	0.141
Cactus Wren	2010	Low Development	0.044	0.116	0	0.434
		BLM Reference	0.095	0.165	0.001	0.657
	2011	High Development	0.063	0.121	0	0.446
		Low Development	0.077	0.119	0.001	0.455
	2011	BLM Reference	0.079	0.137	0.001	0.528
		High Development	0.06	0.116	0	0.431
Canyon Towhee	2012	Low Development	0.07	0.099	0.002	0.359
		BLM Reference	0.072	0.124	0.001	0.492
	2012	High Development	0.059	0.116	0	0.432
		Low Development	0.074	0.109	0.002	0.406
	2013	BLM Reference	0.073	0.128	0.001	0.493
		High Development	0.061	0.12	0	0.458

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Brewer's Blackbird</i>	2014	Low Development	0.073	0.098	0.002	0.359
		BLM Reference	0.077	0.141	0.001	0.559
	2015	High Development	0.062	0.124	0	0.482
		Low Development	0.075	0.097	0.002	0.346
	2016	BLM Reference	0.077	0.14	0.001	0.539
		High Development	0.066	0.134	0	0.522
		Low Development	0.089	0.09	0.004	0.33
<i>Blue Grosbeak</i>	2010	BLM Reference	0.079	0.146	0.001	0.575
		High Development	0.066	0.135	0	0.541
		Low Development	0.086	0.112	0.002	0.403
	2011	BLM Reference	0.085	0.161	0	0.654
		High Development	0.079	0.039	0.023	0.172
		Low Development	0.068	0.043	0.013	0.178
<i>Blue Jay</i>	2012	BLM Reference	0.104	0.043	0.038	0.204
		High Development	0.098	0.033	0.045	0.174
		Low Development	0.128	0.04	0.062	0.222
	2013	BLM Reference	0.182	0.039	0.114	0.267
		High Development	0.167	0.043	0.095	0.263
		Low Development	0.068	0.035	0.02	0.154
<i>Carolina Wren</i>	2014	BLM Reference	0.174	0.042	0.102	0.267
		High Development	0.14	0.049	0.064	0.254
	2015	Low Development	0.145	0.042	0.078	0.24
		BLM Reference	0.188	0.049	0.106	0.295
<i>Chipping Sparrow</i>	2014	High Development	0.132	0.041	0.067	0.228

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Brewer's Sparrow</i>	2015	Low Development	0.148	0.045	0.077	0.251
		BLM Reference	0.163	0.052	0.081	0.283
		High Development	0.138	0.046	0.063	0.243
	2016	Low Development	0.289	0.046	0.206	0.385
		BLM Reference	0.163	0.031	0.106	0.229
	2010	High Development	0.126	0.047	0.054	0.234
<i>Brewer's Sparrow</i>	2011	Low Development	0.185	0.067	0.082	0.336
		BLM Reference	0.226	0.069	0.124	0.394
		High Development	0.781	0.033	0.714	0.843
	2012	Low Development	0.825	0.05	0.715	0.912
		BLM Reference	0.611	0.025	0.562	0.659
		High Development	0.669	0.041	0.585	0.746
<i>Brewer's Sparrow</i>	2013	Low Development	0.605	0.049	0.509	0.699
		BLM Reference	0.532	0.025	0.483	0.58
		High Development	0.558	0.038	0.484	0.63
	2014	Low Development	0.769	0.035	0.698	0.834
		BLM Reference	0.544	0.024	0.496	0.591
		High Development	0.596	0.04	0.515	0.672
<i>Brewer's Sparrow</i>	2015	Low Development	0.536	0.042	0.455	0.617
		BLM Reference	0.532	0.024	0.486	0.578
		High Development	0.685	0.032	0.623	0.746
	2016	Low Development	0.562	0.039	0.484	0.637
		BLM Reference	0.564	0.027	0.512	0.617
		High Development	0.746	0.03	0.684	0.803

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Broad-tailed Hummingbird	2016	Low Development	0.664	0.036	0.592	0.732
		BLM Reference	0.699	0.021	0.658	0.739
		High Development	0.709	0.03	0.65	0.765
	2010	Low Development	0.706	0.032	0.64	0.767
		BLM Reference	0.737	0.019	0.699	0.773
	2011	High Development	0.054	0.053	0.006	0.206
2012	2011	Low Development	0.192	0.153	0.019	0.592
		BLM Reference	0.03	0.05	0.001	0.171
		High Development	0.065	0.045	0.014	0.182
	2013	Low Development	0.182	0.098	0.049	0.424
		BLM Reference	0.026	0.031	0.002	0.109
		High Development	0.077	0.03	0.031	0.147
2014	2012	Low Development	0.251	0.104	0.089	0.488
		BLM Reference	0.025	0.029	0.002	0.103
		High Development	0.089	0.039	0.033	0.181
	2015	Low Development	0.162	0.049	0.081	0.27
		BLM Reference	0.025	0.033	0.002	0.116
		High Development	0.114	0.034	0.058	0.191
2016	2014	Low Development	0.236	0.054	0.141	0.351
		BLM Reference	0.027	0.025	0.002	0.095
	2015	High Development	0.117	0.049	0.043	0.236
		Low Development	0.212	0.066	0.105	0.364
	2016	BLM Reference	0.025	0.029	0.002	0.102
	2016	High Development	0.181	0.041	0.108	0.267

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Brown-headed Cowbird	2010	Low Development	0.204	0.053	0.112	0.316
		BLM Reference	0.028	0.032	0.002	0.116
	2010	High Development	0.209	0.056	0.119	0.332
		Low Development	0.324	0.097	0.161	0.538
	2011	BLM Reference	0.054	0.036	0.012	0.148
		High Development	0.195	0.046	0.116	0.299
2012	2011	Low Development	0.264	0.062	0.157	0.402
		BLM Reference	0.08	0.033	0.031	0.161
	2012	High Development	0.221	0.056	0.13	0.345
		Low Development	0.222	0.066	0.118	0.371
	2013	BLM Reference	0.102	0.033	0.05	0.181
		High Development	0.26	0.051	0.175	0.376
2014	2013	Low Development	0.204	0.051	0.119	0.319
		BLM Reference	0.087	0.039	0.031	0.181
	2014	High Development	0.226	0.049	0.141	0.335
		Low Development	0.176	0.04	0.108	0.264
	2015	BLM Reference	0.133	0.047	0.061	0.241
		High Development	0.256	0.062	0.151	0.396
2016	2015	Low Development	0.266	0.07	0.153	0.426
		BLM Reference	0.11	0.031	0.061	0.181
	2016	High Development	0.25	0.059	0.159	0.39
		Low Development	0.184	0.053	0.099	0.304
	Bullock's Oriole	BLM Reference	0.098	0.04	0.039	0.195
		High Development	0.034	0.055	0.001	0.192

Common Name	Year	Contrast	Mean	SD	LCL	UCL
D. carolinensis	2010	Low Development	0.043	0.112	0	0.409
		BLM Reference	0.065	0.101	0.001	0.374
	2011	High Development	0.031	0.039	0.001	0.143
		Low Development	0.039	0.101	0	0.341
	2012	BLM Reference	0.057	0.079	0.002	0.286
		High Development	0.029	0.046	0.001	0.156
D. deserti	2013	Low Development	0.041	0.108	0	0.376
		BLM Reference	0.056	0.075	0.002	0.275
	2014	High Development	0.029	0.048	0.001	0.164
		Low Development	0.04	0.106	0	0.357
	2015	BLM Reference	0.058	0.09	0.001	0.331
		High Development	0.029	0.051	0.001	0.173
D. heermanni	2016	Low Development	0.041	0.109	0	0.382
		BLM Reference	0.057	0.089	0.001	0.329
	2015	High Development	0.031	0.06	0	0.201
		Low Development	0.045	0.12	0	0.434
	2016	BLM Reference	0.058	0.094	0.001	0.348
		High Development	0.031	0.061	0	0.204
Cassin's Finch	2010	Low Development	0.046	0.121	0	0.445
		BLM Reference	0.064	0.112	0.001	0.419
	2011	High Development	0.083	0.044	0.023	0.193
		Low Development	0.071	0.08	0.006	0.293
	2011	BLM Reference	0.093	0.064	0.015	0.258
		High Development	0.087	0.046	0.024	0.2

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Brewer's Blackbird</i>	2012	Low Development	0.071	0.035	0.023	0.159
		BLM Reference	0.069	0.045	0.012	0.185
	2013	High Development	0.099	0.055	0.027	0.234
		Low Development	0.116	0.061	0.033	0.265
	2014	BLM Reference	0.073	0.05	0.013	0.198
		High Development	0.13	0.05	0.053	0.247
<i>Cactus Wren</i>	2015	Low Development	0.079	0.033	0.03	0.157
		BLM Reference	0.069	0.068	0.006	0.267
	2016	High Development	0.13	0.053	0.05	0.257
		Low Development	0.073	0.037	0.022	0.163
	2017	BLM Reference	0.068	0.068	0.006	0.262
		High Development	0.132	0.09	0.025	0.362
<i>Cedar Waxwing</i>	2010	Low Development	0.075	0.034	0.025	0.155
		BLM Reference	0.069	0.073	0.005	0.283
	2011	High Development	0.163	0.066	0.06	0.31
		Low Development	0.099	0.052	0.027	0.224
	2012	BLM Reference	0.073	0.096	0.003	0.362
		High Development	0.063	0.056	0.008	0.211
<i>Common Grackle</i>	2010	Low Development	0.168	0.141	0.015	0.548
		BLM Reference	0.212	0.085	0.098	0.426
	2011	High Development	0.071	0.039	0.02	0.166
		Low Development	0.176	0.089	0.052	0.391
	2012	BLM Reference	0.17	0.04	0.103	0.259
		High Development	0.089	0.037	0.036	0.176

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Antilocapra americanus</i>	2013	Low Development	0.213	0.087	0.08	0.415
		BLM Reference	0.18	0.034	0.122	0.256
	2014	High Development	0.097	0.029	0.049	0.162
		Low Development	0.174	0.057	0.08	0.301
	2015	BLM Reference	0.144	0.032	0.087	0.214
		High Development	0.092	0.034	0.04	0.173
		Low Development	0.17	0.045	0.094	0.268
<i>Cynomys ludovicianus</i>	2014	BLM Reference	0.128	0.032	0.075	0.2
		High Development	0.153	0.054	0.068	0.28
		Low Development	0.16	0.05	0.08	0.272
	2016	BLM Reference	0.235	0.044	0.16	0.333
		High Development	0.096	0.041	0.036	0.194
		Low Development	0.208	0.066	0.101	0.355
<i>Chestnut-collared Longspur</i>	2010	BLM Reference	0.217	0.052	0.136	0.338
		High Development	0.061	0.12	0	0.44
		Low Development	0.043	0.11	0	0.4
	2011	BLM Reference	0.1	0.06	0.021	0.245
		High Development	0.058	0.115	0	0.437
		Low Development	0.038	0.098	0	0.329
<i>Colinus virginianus</i>	2012	BLM Reference	0.076	0.079	0.007	0.299
		High Development	0.058	0.115	0	0.425
		Low Development	0.041	0.106	0	0.367
	2013	BLM Reference	0.074	0.084	0.006	0.315
		High Development	0.059	0.119	0	0.442

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Chipping Sparrow	2014	Low Development	0.04	0.104	0	0.362
		BLM Reference	0.077	0.101	0.004	0.389
		High Development	0.06	0.123	0	0.464
	2015	Low Development	0.04	0.106	0	0.378
		BLM Reference	0.076	0.103	0.003	0.39
	2016	High Development	0.063	0.132	0	0.506
Chipping Sparrow	2010	Low Development	0.045	0.117	0	0.442
		BLM Reference	0.076	0.108	0.003	0.402
		High Development	0.064	0.133	0	0.52
	2011	Low Development	0.045	0.115	0	0.432
		BLM Reference	0.081	0.127	0.001	0.475
		High Development	0.157	0.091	0.035	0.385
Chipping Sparrow	2012	Low Development	0.045	0.117	0	0.421
		BLM Reference	0.294	0.197	0.031	0.757
		High Development	0.127	0.091	0.02	0.366
	2013	Low Development	0.04	0.105	0	0.365
		BLM Reference	0.268	0.142	0.059	0.599
		High Development	0.121	0.08	0.022	0.33
Chipping Sparrow	2014	Low Development	0.042	0.112	0	0.401
		BLM Reference	0.298	0.128	0.094	0.583
		High Development	0.119	0.077	0.022	0.316
	2015	Low Development	0.042	0.111	0	0.4
		BLM Reference	0.241	0.152	0.039	0.61
		High Development	0.121	0.067	0.028	0.278

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Clay-colored Sparrow</i>	2015	Low Development	0.043	0.114	0	0.423
		BLM Reference	0.226	0.136	0.045	0.559
		High Development	0.121	0.096	0.016	0.383
	2016	Low Development	0.047	0.124	0	0.461
		BLM Reference	0.186	0.113	0.041	0.478
	2010	High Development	0.117	0.072	0.022	0.294
<i>Clay-colored Sparrow</i>	2011	Low Development	0.048	0.126	0	0.48
		BLM Reference	0.213	0.162	0.024	0.631
		High Development	0.136	0.06	0.048	0.277
	2012	Low Development	0.035	0.059	0.001	0.202
		BLM Reference	0.151	0.122	0.017	0.48
		High Development	0.128	0.042	0.06	0.222
<i>Clay-colored Sparrow</i>	2013	Low Development	0.029	0.034	0.003	0.12
		BLM Reference	0.189	0.063	0.085	0.333
		High Development	0.125	0.048	0.051	0.238
	2014	Low Development	0.029	0.038	0.002	0.124
		BLM Reference	0.153	0.059	0.064	0.291
		High Development	0.161	0.056	0.072	0.29
<i>Clay-colored Sparrow</i>	2015	Low Development	0.029	0.026	0.004	0.099
		BLM Reference	0.108	0.046	0.038	0.214
	2015	High Development	0.194	0.057	0.099	0.32
		Low Development	0.031	0.027	0.004	0.103

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Cliff Swallow	2016	Low Development	0.054	0.034	0.011	0.141
		BLM Reference	0.252	0.061	0.146	0.384
		High Development	0.221	0.076	0.104	0.398
	2010	Low Development	0.033	0.034	0.004	0.129
		BLM Reference	0.179	0.084	0.057	0.379
	2011	High Development	0.223	0.125	0.045	0.525
Cliff Swallow	2011	Low Development	0.029	0.048	0.001	0.156
		BLM Reference	0.153	0.081	0.043	0.349
		High Development	0.239	0.117	0.067	0.519
	2012	Low Development	0.025	0.03	0.002	0.107
		BLM Reference	0.109	0.04	0.046	0.2
		High Development	0.291	0.095	0.134	0.503
Cliff Swallow	2013	Low Development	0.025	0.035	0.002	0.119
		BLM Reference	0.12	0.05	0.045	0.239
		High Development	0.211	0.065	0.103	0.356
	2014	Low Development	0.026	0.026	0.003	0.097
		BLM Reference	0.101	0.054	0.027	0.232
		High Development	0.218	0.082	0.091	0.405
Cliff Swallow	2015	Low Development	0.027	0.026	0.004	0.099
		BLM Reference	0.121	0.047	0.053	0.232
		High Development	0.194	0.073	0.078	0.36
	2016	Low Development	0.045	0.033	0.008	0.132
		BLM Reference	0.147	0.052	0.065	0.267
		High Development	0.195	0.074	0.079	0.368

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Grackle	2010	Low Development	0.029	0.033	0.003	0.121
		BLM Reference	0.163	0.089	0.04	0.379
		High Development	0.066	0.126	0	0.481
	2011	Low Development	0.042	0.108	0	0.366
		BLM Reference	0.53	0.118	0.311	0.77
	2012	High Development	0.062	0.12	0	0.458
Common Nighthawk	2013	Low Development	0.039	0.103	0	0.369
		BLM Reference	0.363	0.065	0.245	0.499
		High Development	0.061	0.119	0	0.44
	2014	Low Development	0.042	0.111	0	0.391
		BLM Reference	0.313	0.071	0.193	0.472
		High Development	0.063	0.123	0	0.478
	2015	Low Development	0.042	0.11	0	0.39
		BLM Reference	0.223	0.067	0.113	0.375
		High Development	0.064	0.129	0	0.493
Common Nighthawk	2016	Low Development	0.043	0.114	0	0.401
		BLM Reference	0.326	0.065	0.214	0.468
		High Development	0.067	0.137	0	0.541
	2010	Low Development	0.047	0.124	0	0.463
		BLM Reference	0.307	0.074	0.186	0.47
		High Development	0.068	0.139	0	0.544
	2010	Low Development	0.048	0.126	0	0.474
		BLM Reference	0.403	0.076	0.259	0.555
		High Development	0.07	0.065	0.008	0.247

Common Name	Year	Contrast	Mean	SD	LCL	UCL
		Low Development	0.026	0.04	0.001	0.135
		BLM Reference	0.025	0.021	0.004	0.081
	2011	High Development	0.064	0.054	0.01	0.214
		Low Development	0.023	0.024	0.003	0.088
		BLM Reference	0.033	0.018	0.011	0.081
		High Development	0.064	0.047	0.012	0.187
	2012	Low Development	0.025	0.023	0.003	0.087
		BLM Reference	0.044	0.016	0.019	0.083
		High Development	0.067	0.036	0.019	0.158
		Low Development	0.024	0.022	0.004	0.082
	2013	BLM Reference	0.05	0.016	0.025	0.087
		High Development	0.069	0.042	0.017	0.176
		Low Development	0.03	0.02	0.007	0.083
		BLM Reference	0.04	0.018	0.015	0.084
	2014	High Development	0.146	0.051	0.063	0.259
		Low Development	0.039	0.029	0.008	0.119
		BLM Reference	0.054	0.018	0.027	0.095
		High Development	0.08	0.035	0.029	0.163
	2015	Low Development	0.037	0.026	0.008	0.108
		BLM Reference	0.043	0.021	0.016	0.093
Common Poorwill	2010	High Development	0.058	0.113	0	0.414
		Low Development	0.026	0.058	0	0.183
	2011	BLM Reference	0.089	0.147	0.001	0.572
		High Development	0.054	0.107	0	0.383

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Raven	2012	Low Development	0.02	0.04	0	0.13
		BLM Reference	0.082	0.135	0.001	0.535
	2013	High Development	0.053	0.107	0	0.379
		Low Development	0.022	0.045	0	0.144
	2014	BLM Reference	0.082	0.137	0.001	0.526
		High Development	0.054	0.11	0	0.404
		Low Development	0.02	0.038	0	0.122
Common Raven	2015	BLM Reference	0.087	0.148	0.001	0.574
		High Development	0.054	0.113	0	0.433
		Low Development	0.02	0.037	0	0.122
	2016	BLM Reference	0.086	0.147	0.001	0.574
		High Development	0.057	0.121	0	0.444
		Low Development	0.022	0.045	0	0.148
Common Raven	2010	BLM Reference	0.088	0.153	0.001	0.588
		High Development	0.058	0.123	0	0.466
		Low Development	0.022	0.035	0	0.12
	2011	BLM Reference	0.094	0.166	0.001	0.645
		High Development	0.063	0.071	0.005	0.26
		Low Development	0.053	0.085	0.001	0.302
Common Raven	2012	BLM Reference	0.17	0.066	0.068	0.321
		High Development	0.06	0.045	0.009	0.178
		Low Development	0.047	0.059	0.003	0.211
	2012	BLM Reference	0.099	0.042	0.038	0.201
		High Development	0.068	0.044	0.012	0.179

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Common Yellowthroat	2013	Low Development	0.047	0.063	0.003	0.221
		BLM Reference	0.076	0.033	0.028	0.154
	2014	High Development	0.052	0.044	0.007	0.168
		Low Development	0.047	0.052	0.004	0.19
	2015	BLM Reference	0.079	0.046	0.021	0.2
		High Development	0.052	0.042	0.007	0.162
		Low Development	0.053	0.05	0.006	0.187
Common Yellowthroat	2016	BLM Reference	0.066	0.034	0.021	0.15
		High Development	0.05	0.045	0.005	0.173
		Low Development	0.078	0.05	0.015	0.2
	2010	BLM Reference	0.078	0.027	0.035	0.142
		High Development	0.05	0.052	0.004	0.189
		Low Development	0.055	0.049	0.007	0.189
Common Yellowthroat	2011	BLM Reference	0.061	0.036	0.017	0.15
		High Development	0.06	0.052	0.006	0.196
		Low Development	0.147	0.141	0.009	0.548
	2012	BLM Reference	0.077	0.102	0.003	0.382
		High Development	0.044	0.044	0.004	0.166
		Low Development	0.151	0.087	0.029	0.363
Common Yellowthroat	2013	BLM Reference	0.068	0.072	0.006	0.275
		High Development	0.041	0.04	0.004	0.153
		Low Development	0.105	0.076	0.015	0.301
	2014	BLM Reference	0.068	0.069	0.006	0.265
		High Development	0.039	0.039	0.003	0.14

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Dark-eyed Junco	2014	Low Development	0.102	0.08	0.014	0.315
		BLM Reference	0.071	0.075	0.005	0.28
	2015	High Development	0.038	0.035	0.003	0.134
		Low Development	0.093	0.073	0.012	0.28
	2016	BLM Reference	0.072	0.07	0.006	0.264
		High Development	0.037	0.044	0.002	0.163
Dark-eyed Junco	2010	Low Development	0.09	0.091	0.007	0.349
		BLM Reference	0.077	0.059	0.009	0.231
	2011	High Development	0.036	0.037	0.002	0.141
		Low Development	0.081	0.063	0.01	0.241
	2012	BLM Reference	0.08	0.088	0.005	0.331
		High Development	0.175	0.113	0.03	0.464
Dark-eyed Junco	2013	Low Development	0.031	0.045	0.001	0.156
		BLM Reference	0.039	0.058	0.002	0.21
	2014	High Development	0.136	0.132	0.009	0.505
		Low Development	0.024	0.047	0	0.147
	2015	BLM Reference	0.035	0.039	0.003	0.14
		High Development	0.132	0.136	0.007	0.521
Dark-eyed Junco	2016	Low Development	0.026	0.056	0	0.168
		BLM Reference	0.035	0.035	0.003	0.131
	2017	High Development	0.13	0.142	0.006	0.532
		Low Development	0.024	0.053	0	0.156
	2018	BLM Reference	0.034	0.042	0.002	0.151
		High Development	0.131	0.151	0.005	0.561

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Downy Woodpecker	2015	Low Development	0.024	0.054	0	0.166
		BLM Reference	0.034	0.039	0.002	0.14
	2016	High Development	0.138	0.171	0.003	0.644
		Low Development	0.028	0.07	0	0.219
	2017	BLM Reference	0.036	0.035	0.003	0.13
		High Development	0.135	0.173	0.003	0.66
		Low Development	0.027	0.068	0	0.213
Downy Woodpecker	2010	BLM Reference	0.036	0.05	0.002	0.177
		High Development	0.056	0.038	0.011	0.154
		Low Development	0.115	0.113	0.01	0.438
	2011	BLM Reference	0.052	0.03	0.015	0.128
		High Development	0.08	0.042	0.024	0.184
		Low Development	0.124	0.061	0.038	0.274
Downy Woodpecker	2012	BLM Reference	0.055	0.023	0.021	0.111
		High Development	0.082	0.033	0.033	0.162
		Low Development	0.132	0.069	0.036	0.303
	2013	BLM Reference	0.075	0.029	0.032	0.142
		High Development	0.111	0.038	0.053	0.198
		Low Development	0.091	0.041	0.033	0.189
Downy Woodpecker	2014	BLM Reference	0.058	0.03	0.018	0.135
		High Development	0.103	0.04	0.045	0.199
		Low Development	0.096	0.04	0.039	0.192
	2015	BLM Reference	0.072	0.029	0.029	0.141
		High Development	0.125	0.046	0.055	0.23

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Dusky Flycatcher	2016	Low Development	0.099	0.046	0.034	0.209
		BLM Reference	0.095	0.033	0.044	0.173
		High Development	0.136	0.048	0.06	0.245
	2010	Low Development	0.096	0.037	0.04	0.184
		BLM Reference	0.12	0.042	0.053	0.214
	2011	High Development	0.183	0.072	0.079	0.356
	2011	Low Development	0.104	0.117	0.006	0.444
		BLM Reference	0.099	0.05	0.032	0.221
		High Development	0.275	0.067	0.156	0.421
	2012	Low Development	0.088	0.072	0.012	0.29
		BLM Reference	0.191	0.048	0.108	0.294
		High Development	0.307	0.079	0.176	0.484
	2013	Low Development	0.113	0.081	0.019	0.328
		BLM Reference	0.161	0.051	0.077	0.277
		High Development	0.336	0.084	0.192	0.517
	2014	Low Development	0.099	0.058	0.023	0.242
		BLM Reference	0.149	0.053	0.063	0.267
		High Development	0.205	0.047	0.117	0.302
	2015	Low Development	0.074	0.042	0.016	0.181
		BLM Reference	0.284	0.049	0.194	0.386
		High Development	0.416	0.1	0.236	0.625
	2016	Low Development	0.076	0.069	0.009	0.267
		BLM Reference	0.273	0.05	0.183	0.377
		High Development	0.319	0.056	0.217	0.434

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Eastern Kingbird	2010	Low Development	0.079	0.045	0.017	0.187
		BLM Reference	0.23	0.062	0.121	0.357
		High Development	0.062	0.121	0	0.456
	2011	Low Development	0.036	0.082	0	0.287
		BLM Reference	0.084	0.143	0.001	0.563
	2012	High Development	0.059	0.116	0	0.44
Eurasian Collared-Dove	2013	Low Development	0.03	0.059	0	0.21
		BLM Reference	0.077	0.129	0.001	0.496
		High Development	0.059	0.116	0	0.442
	2014	Low Development	0.033	0.067	0	0.23
		BLM Reference	0.078	0.134	0.001	0.519
		High Development	0.059	0.119	0	0.464
	2015	Low Development	0.031	0.06	0	0.206
		BLM Reference	0.082	0.145	0.001	0.566
		High Development	0.06	0.122	0	0.471
	2016	Low Development	0.032	0.059	0	0.201
		BLM Reference	0.082	0.146	0.001	0.587
		High Development	0.065	0.133	0	0.511
Eurasian Collared-Dove	2010	Low Development	0.035	0.068	0	0.251
		BLM Reference	0.084	0.151	0.001	0.597
		High Development	0.065	0.135	0	0.536
Eurasian Collared-Dove	2010	Low Development	0.036	0.062	0.001	0.218
		BLM Reference	0.09	0.166	0	0.662
		High Development	0.06	0.117	0	0.436

Common Name	Year	Contrast	Mean	SD	LCL	UCL
European Starling	2010	Low Development	0.043	0.112	0	0.398
		BLM Reference	0.103	0.124	0.004	0.459
	2011	High Development	0.056	0.109	0	0.4
		Low Development	0.038	0.099	0	0.331
	2012	BLM Reference	0.093	0.095	0.007	0.357
		High Development	0.055	0.108	0	0.395
European Starling	2013	Low Development	0.041	0.106	0	0.372
		BLM Reference	0.093	0.092	0.007	0.353
	2014	High Development	0.057	0.113	0	0.412
		Low Development	0.04	0.106	0	0.364
	2015	BLM Reference	0.099	0.105	0.006	0.397
		High Development	0.057	0.116	0	0.432
European Starling	2016	Low Development	0.042	0.108	0	0.388
		BLM Reference	0.097	0.095	0.007	0.359
	2017	High Development	0.061	0.127	0	0.485
		Low Development	0.046	0.118	0	0.418
	2018	BLM Reference	0.101	0.086	0.009	0.327
		High Development	0.062	0.128	0	0.477
European Starling	2019	Low Development	0.046	0.118	0	0.437
		BLM Reference	0.109	0.119	0.005	0.451
	2020	High Development	0.059	0.081	0.002	0.297
		Low Development	0.084	0.111	0.003	0.424
European Starling	2021	BLM Reference	0.099	0.11	0.005	0.421
		High Development	0.055	0.067	0.003	0.245

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2012	Low Development	0.071	0.077	0.005	0.29
		BLM Reference	0.088	0.076	0.009	0.303
	2013	High Development	0.054	0.061	0.003	0.232
		Low Development	0.073	0.085	0.004	0.307
	2014	BLM Reference	0.093	0.068	0.012	0.266
		High Development	0.054	0.059	0.004	0.219
Burrowing Owl	2015	Low Development	0.071	0.067	0.006	0.256
		BLM Reference	0.086	0.085	0.007	0.322
	2016	High Development	0.054	0.056	0.004	0.21
		Low Development	0.087	0.063	0.011	0.248
	2017	BLM Reference	0.084	0.076	0.008	0.299
		High Development	0.068	0.058	0.006	0.224
Ferruginous Hawk	2010	Low Development	0.074	0.054	0.01	0.21
		BLM Reference	0.082	0.071	0.008	0.272
	2011	High Development	0.058	0.055	0.004	0.204
		Low Development	0.083	0.07	0.009	0.275
	2012	BLM Reference	0.088	0.098	0.004	0.37
		High Development	0.034	0.063	0.001	0.206
Ferruginous Hawk	2011	Low Development	0.042	0.111	0	0.389
		BLM Reference	0.046	0.073	0.001	0.258
	2012	High Development	0.03	0.051	0.001	0.175
		Low Development	0.038	0.101	0	0.356
	2013	BLM Reference	0.039	0.051	0.002	0.183
		High Development	0.029	0.047	0.001	0.16

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2013	Low Development	0.04	0.109	0	0.372
		BLM Reference	0.038	0.048	0.002	0.178
	2013	High Development	0.028	0.044	0.001	0.154
		Low Development	0.039	0.106	0	0.354
	2014	BLM Reference	0.039	0.055	0.001	0.191
		High Development	0.028	0.045	0.001	0.158
Red-shouldered Hawk	2014	Low Development	0.04	0.11	0	0.379
		BLM Reference	0.037	0.047	0.002	0.169
	2015	High Development	0.029	0.039	0.001	0.14
		Low Development	0.044	0.118	0	0.424
	2016	BLM Reference	0.036	0.041	0.002	0.149
		High Development	0.029	0.048	0.001	0.166
Burrowing Owl	2016	Low Development	0.045	0.12	0	0.445
		BLM Reference	0.039	0.057	0.001	0.199
	2010	High Development	0.061	0.122	0	0.465
		Low Development	0.046	0.115	0	0.416
	2011	BLM Reference	0.043	0.048	0.002	0.175
		High Development	0.057	0.115	0	0.433
Golden Eagle	2011	Low Development	0.041	0.105	0	0.371
		BLM Reference	0.04	0.055	0.002	0.191
	2012	High Development	0.056	0.115	0	0.429
		Low Development	0.044	0.113	0	0.422
	2013	BLM Reference	0.039	0.058	0.002	0.198
		High Development	0.057	0.119	0	0.442

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Grasshopper Sparrow</i>	2014	Low Development	0.044	0.114	0	0.443
		BLM Reference	0.042	0.07	0.001	0.246
		High Development	0.059	0.123	0	0.473
	2015	Low Development	0.045	0.118	0	0.435
		BLM Reference	0.041	0.07	0.001	0.252
	2016	High Development	0.063	0.133	0	0.528
<i>Grasshopper Sparrow</i>	2010	Low Development	0.049	0.128	0	0.475
		BLM Reference	0.042	0.075	0.001	0.267
		High Development	0.063	0.135	0	0.516
	2011	Low Development	0.05	0.129	0	0.5
		BLM Reference	0.046	0.091	0.001	0.327
		High Development	0.057	0.114	0	0.435
<i>Grasshopper Sparrow</i>	2012	Low Development	0.094	0.137	0.001	0.515
		BLM Reference	0.153	0.093	0.028	0.375
		High Development	0.053	0.104	0	0.381
	2013	Low Development	0.084	0.111	0.002	0.409
		BLM Reference	0.126	0.113	0.011	0.441
		High Development	0.052	0.106	0	0.386
<i>Grasshopper Sparrow</i>	2014	Low Development	0.09	0.121	0.002	0.458
		BLM Reference	0.124	0.118	0.009	0.454
	2015	High Development	0.053	0.11	0	0.407
		Low Development	0.091	0.114	0.002	0.423
	2016	BLM Reference	0.132	0.141	0.006	0.541
	2017	High Development	0.054	0.115	0	0.432

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Gray Catbird	2015	Low Development	0.095	0.116	0.002	0.443
		BLM Reference	0.129	0.141	0.006	0.528
		High Development	0.058	0.127	0	0.495
	2016	Low Development	0.116	0.111	0.004	0.407
		BLM Reference	0.132	0.151	0.005	0.562
	2010	High Development	0.058	0.127	0	0.482
Gray Catbird	2011	Low Development	0.108	0.131	0.002	0.486
		BLM Reference	0.143	0.178	0.003	0.673
		High Development	0.033	0.053	0.001	0.187
	2012	Low Development	0.041	0.103	0	0.341
		BLM Reference	0.126	0.133	0.006	0.505
		High Development	0.03	0.044	0.001	0.154
Gray Catbird	2013	Low Development	0.037	0.094	0	0.33
		BLM Reference	0.118	0.104	0.01	0.398
		High Development	0.028	0.04	0.001	0.141
	2014	Low Development	0.04	0.101	0	0.359
		BLM Reference	0.122	0.096	0.013	0.363
		High Development	0.028	0.036	0.001	0.132
Gray Catbird	2015	Low Development	0.039	0.101	0	0.346
		BLM Reference	0.121	0.125	0.007	0.477
	2015	High Development	0.028	0.043	0.001	0.153
		Low Development	0.04	0.105	0	0.379

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Gray Flycatcher	2016	Low Development	0.044	0.113	0	0.423
		BLM Reference	0.124	0.13	0.006	0.483
		High Development	0.029	0.049	0.001	0.164
	2010	Low Development	0.045	0.117	0	0.443
		BLM Reference	0.133	0.154	0.004	0.574
	2011	High Development	0.087	0.094	0.007	0.346
	2012	Low Development	0.201	0.167	0.016	0.64
		BLM Reference	0.228	0.186	0.018	0.708
		High Development	0.084	0.07	0.012	0.272
	2013	Low Development	0.199	0.119	0.04	0.496
		BLM Reference	0.22	0.141	0.035	0.565
		High Development	0.083	0.061	0.015	0.237
	2014	Low Development	0.271	0.11	0.093	0.516
		BLM Reference	0.225	0.131	0.046	0.539
		High Development	0.093	0.052	0.024	0.226
	2015	Low Development	0.228	0.111	0.065	0.498
		BLM Reference	0.235	0.145	0.041	0.59
		High Development	0.083	0.043	0.023	0.189
	2016	Low Development	0.232	0.077	0.102	0.405
		BLM Reference	0.242	0.125	0.063	0.54
	2015	High Development	0.125	0.067	0.033	0.29
		Low Development	0.198	0.073	0.08	0.361
	2016	BLM Reference	0.296	0.096	0.136	0.509
		High Development	0.103	0.046	0.033	0.21

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Greater Sage-Grouse	2010	Low Development	0.35	0.077	0.206	0.504
		BLM Reference	0.178	0.086	0.048	0.374
		High Development	0.025	0.028	0.002	0.105
		Low Development	0.03	0.05	0.001	0.167
	2011	BLM Reference	0.068	0.054	0.01	0.217
		High Development	0.022	0.024	0.002	0.091
		Low Development	0.026	0.028	0.003	0.102
	2012	BLM Reference	0.069	0.035	0.02	0.155
		High Development	0.02	0.025	0.002	0.089
		Low Development	0.028	0.033	0.003	0.114
	2013	BLM Reference	0.083	0.049	0.02	0.201
		High Development	0.019	0.025	0.002	0.086
		Low Development	0.031	0.025	0.006	0.098
	2014	BLM Reference	0.086	0.051	0.02	0.211
		High Development	0.019	0.026	0.001	0.087
		Low Development	0.035	0.023	0.009	0.093
	2015	BLM Reference	0.128	0.069	0.033	0.297
		High Development	0.019	0.031	0.001	0.101
		Low Development	0.041	0.027	0.01	0.111
	2016	BLM Reference	0.133	0.08	0.029	0.335
		High Development	0.02	0.029	0.001	0.102
		Low Development	0.051	0.03	0.013	0.129
	Green-tailed Towhee	BLM Reference	0.223	0.094	0.072	0.435
		High Development	0.505	0.052	0.407	0.608

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Hairy Woodpecker	2011	Low Development	0.624	0.063	0.5	0.745
		BLM Reference	0.2	0.035	0.136	0.273
		High Development	0.521	0.045	0.432	0.61
	2012	Low Development	0.586	0.05	0.486	0.682
		BLM Reference	0.438	0.036	0.367	0.51
	2013	High Development	0.446	0.043	0.362	0.53
Hairy Woodpecker	2014	Low Development	0.463	0.05	0.365	0.562
		BLM Reference	0.407	0.04	0.33	0.485
		High Development	0.578	0.041	0.5	0.656
	2015	Low Development	0.466	0.041	0.387	0.546
		BLM Reference	0.374	0.036	0.305	0.445
		High Development	0.531	0.038	0.456	0.604
Hairy Woodpecker	2016	Low Development	0.599	0.038	0.522	0.672
		BLM Reference	0.433	0.037	0.362	0.507
		High Development	0.671	0.04	0.592	0.748
	2010	Low Development	0.735	0.036	0.664	0.802
		BLM Reference	0.511	0.038	0.437	0.588
		High Development	0.572	0.033	0.509	0.635
Hairy Woodpecker	2011	Low Development	0.717	0.032	0.653	0.778
		BLM Reference	0.394	0.033	0.33	0.459
		High Development	0.057	0.11	0	0.415
		Low Development	0.045	0.115	0	0.434
		BLM Reference	0.044	0.069	0.001	0.247
		High Development	0.053	0.103	0	0.384

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2012	Low Development	0.042	0.106	0	0.381
		BLM Reference	0.038	0.052	0.002	0.179
	2012	High Development	0.052	0.102	0	0.374
		Low Development	0.044	0.113	0	0.395
	2013	BLM Reference	0.037	0.05	0.002	0.173
		High Development	0.053	0.104	0	0.398
Burrowing Owl	2014	Low Development	0.044	0.114	0	0.427
		BLM Reference	0.039	0.06	0.001	0.21
	2014	High Development	0.054	0.109	0	0.413
		Low Development	0.045	0.116	0	0.411
	2015	BLM Reference	0.037	0.048	0.002	0.166
		High Development	0.057	0.12	0	0.462
Burrowing Owl	2016	Low Development	0.05	0.128	0	0.49
		BLM Reference	0.037	0.056	0.001	0.192
	2016	High Development	0.057	0.121	0	0.467
		Low Development	0.051	0.131	0	0.507
	2016	BLM Reference	0.041	0.069	0.001	0.241
		High Development	0.631	0.043	0.546	0.713
Horned Lark	2010	Low Development	0.727	0.083	0.55	0.875
		BLM Reference	0.597	0.024	0.549	0.644
		High Development	0.442	0.047	0.35	0.535
Horned Lark	2011	Low Development	0.521	0.067	0.389	0.647
		BLM Reference	0.579	0.023	0.532	0.624
		High Development	0.435	0.036	0.366	0.507

Common Name	Year	Contrast	Mean	SD	LCL	UCL
House Sparrow	2013	Low Development	0.363	0.043	0.281	0.449
		BLM Reference	0.649	0.023	0.605	0.693
	2014	High Development	0.507	0.047	0.415	0.6
		Low Development	0.67	0.078	0.516	0.815
	2015	BLM Reference	0.573	0.024	0.526	0.619
		High Development	0.554	0.039	0.478	0.632
		Low Development	0.67	0.069	0.532	0.802
House Finch	2016	BLM Reference	0.608	0.03	0.548	0.665
		High Development	0.493	0.038	0.417	0.568
		Low Development	0.312	0.045	0.227	0.406
	2010	BLM Reference	0.648	0.022	0.604	0.691
		High Development	0.404	0.036	0.334	0.474
		Low Development	0.699	0.059	0.579	0.809
2011	2011	BLM Reference	0.643	0.021	0.601	0.682
		High Development	0.059	0.114	0	0.422
		Low Development	0.044	0.108	0	0.385
	2012	BLM Reference	0.054	0.04	0.009	0.158
		High Development	0.055	0.106	0	0.394
		Low Development	0.039	0.096	0	0.327
2013	2013	BLM Reference	0.07	0.033	0.024	0.152
		High Development	0.055	0.106	0	0.388
		Low Development	0.042	0.103	0	0.365
	2014	BLM Reference	0.08	0.037	0.028	0.17
		High Development	0.055	0.109	0	0.41

Common Name	Year	Contrast	Mean	SD	LCL	UCL	
<i>House Wren</i>	2014	Low Development	0.041	0.103	0	0.366	
		BLM Reference	0.099	0.055	0.027	0.235	
		High Development	0.057	0.113	0	0.412	
	2015	Low Development	0.043	0.106	0	0.381	
		BLM Reference	0.14	0.05	0.064	0.255	
	2016	High Development	0.06	0.124	0	0.46	
<i>House Wren</i>	2010	Low Development	0.047	0.117	0	0.422	
		BLM Reference	0.12	0.044	0.053	0.222	
		High Development	0.061	0.125	0	0.488	
	2011	Low Development	0.048	0.12	0	0.453	
		BLM Reference	0.167	0.096	0.039	0.407	
	2012	High Development	0.057	0.115	0	0.424	
<i>House Wren</i>		Low Development	0.046	0.116	0	0.435	
		BLM Reference	0.153	0.139	0.011	0.539	
		High Development	0.055	0.11	0	0.419	
2013	Low Development	0.041	0.106	0	0.38		
	BLM Reference	0.143	0.09	0.023	0.358		
2014	High Development	0.054	0.112	0	0.429		
	Low Development	0.045	0.115	0	0.415		
	BLM Reference	0.141	0.109	0.015	0.424		
<i>House Wren</i>	2013	High Development	0.055	0.115	0	0.427	
		Low Development	0.044	0.112	0	0.417	
	2014	BLM Reference	0.148	0.134	0.011	0.514	
<i>House Wren</i>	2014	High Development	0.056	0.118	0	0.454	

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Juniper Titmouse	2015	Low Development	0.045	0.114	0	0.424
		BLM Reference	0.15	0.136	0.01	0.519
	2015	High Development	0.06	0.127	0	0.491
		Low Development	0.049	0.124	0	0.48
	2016	BLM Reference	0.154	0.148	0.009	0.552
		High Development	0.061	0.13	0	0.5
		Low Development	0.05	0.127	0	0.486
Juniper Titmouse	2010	BLM Reference	0.162	0.173	0.006	0.645
		High Development	0.042	0.067	0.001	0.24
		Low Development	0.026	0.056	0	0.176
	2011	BLM Reference	0.037	0.038	0.002	0.141
		High Development	0.038	0.053	0.002	0.187
		Low Development	0.02	0.038	0	0.12
	2012	BLM Reference	0.032	0.031	0.003	0.118
		High Development	0.036	0.047	0.002	0.172
		Low Development	0.022	0.033	0.001	0.117
	2013	BLM Reference	0.029	0.031	0.002	0.112
		High Development	0.039	0.047	0.002	0.168
		Low Development	0.02	0.041	0	0.129
Juniper Titmouse	2014	BLM Reference	0.029	0.036	0.002	0.128
		High Development	0.036	0.043	0.002	0.154
	2015	Low Development	0.02	0.042	0	0.128
		BLM Reference	0.028	0.034	0.002	0.127
Juniper Titmouse	2015	High Development	0.039	0.045	0.002	0.164

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Killdeer	2016	Low Development	0.022	0.053	0	0.163
		BLM Reference	0.028	0.032	0.002	0.12
		High Development	0.037	0.042	0.002	0.154
	2010	Low Development	0.023	0.054	0	0.171
		BLM Reference	0.028	0.044	0.001	0.149
	2011	High Development	0.056	0.049	0.008	0.188
Killdeer	2011	Low Development	0.079	0.114	0.001	0.422
		BLM Reference	0.033	0.024	0.006	0.097
		High Development	0.059	0.04	0.013	0.16
	2012	Low Development	0.069	0.086	0.002	0.314
		BLM Reference	0.028	0.017	0.007	0.071
		High Development	0.055	0.03	0.015	0.13
Killdeer	2013	Low Development	0.074	0.097	0.002	0.357
		BLM Reference	0.027	0.019	0.006	0.075
		High Development	0.048	0.031	0.011	0.13
	2014	Low Development	0.073	0.087	0.002	0.324
		BLM Reference	0.021	0.02	0.003	0.073
		High Development	0.044	0.03	0.009	0.123
Killdeer	2015	Low Development	0.076	0.078	0.003	0.276
		BLM Reference	0.028	0.021	0.005	0.083
		High Development	0.047	0.033	0.009	0.131
	2016	Low Development	0.083	0.109	0.002	0.405
		BLM Reference	0.025	0.019	0.004	0.075
		High Development	0.048	0.033	0.01	0.132

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Lark Bunting	2010	Low Development	0.085	0.105	0.002	0.395
		BLM Reference	0.028	0.029	0.003	0.108
	2010	High Development	0.035	0.062	0.001	0.207
		Low Development	0.039	0.08	0	0.28
	2011	BLM Reference	0.469	0.083	0.319	0.644
		High Development	0.031	0.049	0.001	0.176
Lark Sparrow	2012	Low Development	0.033	0.06	0	0.209
		BLM Reference	0.65	0.056	0.535	0.758
	2012	High Development	0.03	0.044	0.001	0.155
		Low Development	0.035	0.069	0	0.238
	2013	BLM Reference	0.565	0.08	0.409	0.724
		High Development	0.029	0.042	0.001	0.148
	2014	Low Development	0.033	0.059	0	0.209
		BLM Reference	0.284	0.049	0.193	0.384
Lark Sparrow	2014	High Development	0.029	0.04	0.001	0.147
		Low Development	0.034	0.055	0.001	0.2
	2015	BLM Reference	0.603	0.07	0.466	0.739
		High Development	0.03	0.046	0.001	0.16
	2015	Low Development	0.037	0.071	0	0.255
		BLM Reference	0.333	0.065	0.23	0.485
Lark Sparrow	2016	High Development	0.029	0.038	0.001	0.137
		Low Development	0.038	0.072	0	0.253
	2016	BLM Reference	0.16	0.052	0.081	0.266
		High Development	0.055	0.112	0	0.414

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Blue Grosbeak	2010	Low Development	0.039	0.104	0	0.354
		BLM Reference	0.069	0.106	0.001	0.4
	2011	High Development	0.053	0.107	0	0.374
		Low Development	0.035	0.095	0	0.307
	2012	BLM Reference	0.061	0.081	0.002	0.298
		High Development	0.051	0.104	0	0.373
		Low Development	0.036	0.098	0	0.33
Cassin's Vireo	2013	BLM Reference	0.061	0.081	0.001	0.304
		High Development	0.051	0.106	0	0.377
		Low Development	0.037	0.102	0	0.342
	2014	BLM Reference	0.064	0.091	0.001	0.332
		High Development	0.053	0.112	0	0.417
		Low Development	0.037	0.103	0	0.346
Chestnut-sided Warbler	2015	BLM Reference	0.064	0.081	0.002	0.29
		High Development	0.056	0.122	0	0.449
		Low Development	0.041	0.113	0	0.39
	2016	BLM Reference	0.064	0.091	0.001	0.337
		High Development	0.056	0.123	0	0.462
		Low Development	0.042	0.115	0	0.409
Lazuli Bunting	2010	BLM Reference	0.07	0.11	0.001	0.404
		High Development	0.068	0.074	0.005	0.271
		Low Development	0.047	0.118	0	0.433
	2011	BLM Reference	0.263	0.126	0.073	0.553
	2011	High Development	0.068	0.057	0.009	0.225

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Least Bell's Vireo	2010	Low Development	0.043	0.109	0	0.375
		BLM Reference	0.199	0.079	0.074	0.378
	2012	High Development	0.067	0.045	0.012	0.178
		Low Development	0.046	0.117	0	0.437
	2013	BLM Reference	0.171	0.064	0.069	0.315
		High Development	0.07	0.044	0.013	0.183
Least Chipping Sparrow	2014	Low Development	0.046	0.119	0	0.444
		BLM Reference	0.18	0.103	0.041	0.43
	2015	High Development	0.08	0.048	0.016	0.201
		Low Development	0.047	0.121	0	0.443
	2016	BLM Reference	0.148	0.056	0.061	0.277
		High Development	0.107	0.065	0.019	0.267
Least Flycatcher	2010	Low Development	0.052	0.133	0	0.524
		BLM Reference	0.18	0.061	0.079	0.314
	2011	High Development	0.082	0.054	0.015	0.219
		Low Development	0.053	0.135	0	0.53
	2012	BLM Reference	0.238	0.101	0.086	0.476
		High Development	0.141	0.123	0.012	0.477
Least Woodpecker	2010	Low Development	0.035	0.067	0	0.223
		BLM Reference	0.195	0.156	0.019	0.617
	2011	High Development	0.144	0.083	0.029	0.337
		Low Development	0.028	0.041	0.001	0.15
	2012	BLM Reference	0.213	0.116	0.053	0.491
		High Development	0.131	0.09	0.02	0.367

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Loggerhead Shrike	2013	Low Development	0.031	0.06	0	0.205
		BLM Reference	0.228	0.099	0.083	0.465
	2014	High Development	0.13	0.091	0.02	0.369
		Low Development	0.028	0.051	0	0.173
	2015	BLM Reference	0.294	0.146	0.069	0.627
		High Development	0.131	0.091	0.019	0.358
		Low Development	0.028	0.054	0	0.181
Loggerhead Shrike	2016	BLM Reference	0.299	0.102	0.134	0.528
		High Development	0.137	0.111	0.013	0.423
		Low Development	0.031	0.067	0	0.222
	2010	BLM Reference	0.418	0.11	0.219	0.647
		High Development	0.134	0.09	0.018	0.359
		Low Development	0.032	0.067	0	0.224
Loggerhead Shrike	2011	BLM Reference	0.542	0.142	0.273	0.818
		High Development	0.088	0.104	0.005	0.4
		Low Development	0.044	0.112	0	0.396
	2012	BLM Reference	0.036	0.03	0.006	0.113
		High Development	0.088	0.084	0.008	0.322
		Low Development	0.039	0.101	0	0.345
Loggerhead Shrike	2013	BLM Reference	0.043	0.021	0.015	0.093
		High Development	0.09	0.077	0.011	0.3
	2013	Low Development	0.041	0.108	0	0.375
		BLM Reference	0.045	0.024	0.014	0.105

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2014	Low Development	0.041	0.107	0	0.384
		BLM Reference	0.047	0.029	0.011	0.121
	2014	High Development	0.099	0.074	0.015	0.288
		Low Development	0.043	0.113	0	0.398
	2015	BLM Reference	0.056	0.027	0.018	0.122
		High Development	0.175	0.06	0.078	0.311
Burrowing Owl	2016	Low Development	0.047	0.123	0	0.442
		BLM Reference	0.077	0.034	0.028	0.158
	2016	High Development	0.111	0.072	0.019	0.289
		Low Development	0.049	0.126	0	0.474
	2016	BLM Reference	0.129	0.047	0.057	0.239
		High Development	0.043	0.071	0.001	0.261
Long-eared Owl	2010	Low Development	0.044	0.109	0	0.406
		BLM Reference	0.637	0.117	0.405	0.859
		High Development	0.04	0.062	0.001	0.213
	2011	Low Development	0.039	0.098	0	0.346
		BLM Reference	0.372	0.062	0.257	0.501
		High Development	0.039	0.059	0.001	0.217
Long-eared Owl	2012	Low Development	0.041	0.106	0	0.372
		BLM Reference	0.297	0.069	0.187	0.461
		High Development	0.038	0.06	0.001	0.212
	2013	Low Development	0.04	0.103	0	0.368
		BLM Reference	0.3	0.074	0.175	0.469
		High Development	0.039	0.056	0.001	0.207

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>MacGillivray's Warbler</i>	2015	Low Development	0.042	0.108	0	0.393
		BLM Reference	0.292	0.072	0.179	0.457
		High Development	0.041	0.072	0.001	0.265
	2016	Low Development	0.045	0.117	0	0.433
		BLM Reference	0.351	0.07	0.225	0.495
	2010	High Development	0.042	0.07	0.001	0.254
<i>MacGillivray's Warbler</i>	2011	Low Development	0.046	0.12	0	0.458
		BLM Reference	0.264	0.101	0.113	0.504
		High Development	0.039	0.065	0.001	0.221
	2012	Low Development	0.03	0.066	0	0.223
		BLM Reference	0.044	0.069	0.001	0.237
		High Development	0.035	0.053	0.001	0.184
<i>MacGillivray's Warbler</i>	2013	Low Development	0.025	0.049	0	0.158
		BLM Reference	0.038	0.048	0.002	0.164
		High Development	0.033	0.049	0.001	0.173
	2014	Low Development	0.026	0.054	0	0.186
		BLM Reference	0.037	0.047	0.002	0.159
		High Development	0.033	0.046	0.001	0.155
<i>MacGillivray's Warbler</i>	2015	Low Development	0.025	0.048	0	0.159
		BLM Reference	0.039	0.046	0.002	0.157
	2015	High Development	0.033	0.051	0.001	0.176
		Low Development	0.025	0.047	0	0.159

Common Name	Year	Contrast	Mean	SD	LCL	UCL
McCown's Longspur	2016	Low Development	0.029	0.047	0	0.163
		BLM Reference	0.038	0.052	0.002	0.181
		High Development	0.034	0.059	0.001	0.199
	2010	Low Development	0.028	0.055	0	0.186
		BLM Reference	0.04	0.064	0.001	0.223
	2011	High Development	0.061	0.119	0	0.442
2012	2011	Low Development	0.045	0.113	0	0.44
		BLM Reference	0.84	0.074	0.669	0.957
		High Development	0.057	0.112	0	0.414
	2013	Low Development	0.041	0.104	0	0.365
		BLM Reference	0.746	0.071	0.593	0.869
		High Development	0.057	0.114	0	0.427
2014	2012	Low Development	0.043	0.111	0	0.405
		BLM Reference	0.835	0.048	0.731	0.918
		High Development	0.057	0.118	0	0.44
	2015	Low Development	0.042	0.108	0	0.394
		BLM Reference	0.888	0.044	0.788	0.96
		High Development	0.059	0.122	0	0.458
2016	2014	Low Development	0.043	0.111	0	0.408
		BLM Reference	0.813	0.069	0.654	0.926
		High Development	0.062	0.13	0	0.494
	2015	Low Development	0.048	0.122	0	0.455
		BLM Reference	0.755	0.07	0.609	0.884
		High Development	0.062	0.133	0	0.515

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mountain Bluebird	2010	Low Development	0.047	0.122	0	0.462
		BLM Reference	0.812	0.065	0.671	0.92
	2010	High Development	0.036	0.066	0.001	0.214
		Low Development	0.046	0.113	0	0.401
	2011	BLM Reference	0.604	0.113	0.381	0.82
		High Development	0.032	0.055	0.001	0.182
		Low Development	0.042	0.104	0	0.371
Mountain Chickadee	2012	BLM Reference	0.273	0.11	0.099	0.519
		High Development	0.031	0.049	0.001	0.162
		Low Development	0.045	0.114	0	0.401
	2013	BLM Reference	0.26	0.08	0.124	0.437
		High Development	0.03	0.047	0.001	0.163
		Low Development	0.044	0.11	0	0.382
Mountain Chickadee	2014	BLM Reference	0.138	0.071	0.038	0.312
		High Development	0.03	0.047	0.001	0.153
		Low Development	0.045	0.114	0	0.407
	2015	BLM Reference	0.137	0.066	0.045	0.301
		High Development	0.032	0.052	0.001	0.181
		Low Development	0.05	0.125	0	0.49
Mountain Chickadee	2016	BLM Reference	0.111	0.061	0.029	0.263
		High Development	0.031	0.044	0.001	0.149
		Low Development	0.05	0.125	0	0.476
	2010	BLM Reference	0.098	0.089	0.011	0.354
		High Development	0.063	0.121	0	0.447

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.026	0.056	0	0.179
		BLM Reference	0.117	0.111	0.01	0.424
	2011	High Development	0.057	0.112	0	0.421
		Low Development	0.022	0.04	0	0.131
	2012	BLM Reference	0.12	0.075	0.027	0.309
		High Development	0.058	0.115	0	0.433
Burrowing Owl	2013	Low Development	0.022	0.044	0	0.144
		BLM Reference	0.132	0.065	0.04	0.288
	2014	High Development	0.059	0.116	0	0.439
		Low Development	0.021	0.039	0	0.132
	2015	BLM Reference	0.153	0.099	0.03	0.412
		High Development	0.06	0.122	0	0.465
Burrowing Owl	2016	Low Development	0.021	0.034	0.001	0.117
		BLM Reference	0.157	0.062	0.061	0.299
	2017	High Development	0.063	0.13	0	0.496
		Low Development	0.023	0.047	0	0.16
	2018	BLM Reference	0.176	0.079	0.058	0.355
		High Development	0.064	0.132	0	0.497
Mountain Plover	2010	Low Development	0.023	0.046	0	0.146
		BLM Reference	0.375	0.143	0.133	0.679
	2011	High Development	0.061	0.116	0	0.43
		Low Development	0.043	0.109	0	0.366
	2012	BLM Reference	0.104	0.1	0.009	0.38
		High Development	0.056	0.105	0	0.389

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mourning Dove	2010	Low Development	0.038	0.098	0	0.321
		BLM Reference	0.104	0.06	0.023	0.252
	2012	High Development	0.056	0.107	0	0.387
		Low Development	0.04	0.104	0	0.354
	2013	BLM Reference	0.133	0.08	0.028	0.329
		High Development	0.056	0.108	0	0.386
Mourning Dove	2014	Low Development	0.039	0.102	0	0.338
		BLM Reference	0.162	0.107	0.027	0.43
	2015	High Development	0.058	0.114	0	0.421
		Low Development	0.041	0.107	0	0.361
	2016	BLM Reference	0.165	0.081	0.045	0.355
		High Development	0.062	0.125	0	0.482
Mourning Dove	2010	Low Development	0.044	0.117	0	0.42
		BLM Reference	0.228	0.116	0.053	0.493
	2011	High Development	0.061	0.125	0	0.473
		Low Development	0.045	0.119	0	0.44
	2012	BLM Reference	0.44	0.088	0.277	0.616
		High Development	0.141	0.074	0.043	0.325
Mourning Dove	2010	Low Development	0.091	0.095	0.007	0.362
		BLM Reference	0.073	0.051	0.014	0.208
	2011	High Development	0.106	0.051	0.034	0.229
		Low Development	0.093	0.045	0.03	0.201
	2012	BLM Reference	0.077	0.032	0.03	0.153
		High Development	0.114	0.035	0.059	0.193

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-shafted Flicker	2013	Low Development	0.082	0.046	0.021	0.199
		BLM Reference	0.111	0.035	0.056	0.195
	2014	High Development	0.157	0.035	0.099	0.232
		Low Development	0.101	0.043	0.036	0.204
	2015	BLM Reference	0.1	0.032	0.048	0.172
		High Development	0.165	0.037	0.102	0.249
		Low Development	0.176	0.05	0.096	0.291
Northern Flicker	2016	BLM Reference	0.12	0.045	0.051	0.225
		High Development	0.236	0.038	0.168	0.315
		Low Development	0.146	0.04	0.078	0.231
	2010	BLM Reference	0.152	0.033	0.095	0.224
		High Development	0.177	0.042	0.11	0.276
		Low Development	0.14	0.044	0.072	0.242
2011	2011	BLM Reference	0.094	0.032	0.045	0.17
		High Development	0.058	0.116	0	0.429
		Low Development	0.039	0.102	0	0.354
	2012	BLM Reference	0.075	0.081	0.006	0.299
		High Development	0.054	0.108	0	0.395
		Low Development	0.034	0.091	0	0.309
2013	2013	BLM Reference	0.074	0.046	0.016	0.194
		High Development	0.054	0.109	0	0.4
		Low Development	0.037	0.1	0	0.341
	2014	BLM Reference	0.067	0.044	0.014	0.181
		High Development	0.055	0.113	0	0.413

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Red-tailed Hawk</i>	2014	Low Development	0.036	0.097	0	0.336
		BLM Reference	0.095	0.06	0.021	0.245
	2014	High Development	0.055	0.117	0	0.44
		Low Development	0.037	0.1	0	0.339
	2015	BLM Reference	0.064	0.033	0.018	0.144
		High Development	0.058	0.124	0	0.469
<i>Northern Harrier</i>	2016	Low Development	0.041	0.112	0	0.404
		BLM Reference	0.069	0.037	0.018	0.164
		High Development	0.059	0.127	0	0.494
	2010	Low Development	0.041	0.112	0	0.389
		BLM Reference	0.056	0.041	0.01	0.164
		High Development	0.057	0.058	0.004	0.215
<i>Burrowing Owl</i>	2011	Low Development	0.029	0.06	0	0.194
		BLM Reference	0.041	0.048	0.002	0.178
		High Development	0.042	0.054	0.002	0.195
	2012	Low Development	0.024	0.045	0	0.15
		BLM Reference	0.032	0.041	0.002	0.148
		High Development	0.04	0.053	0.002	0.193
<i>Greater Sage-Grouse</i>	2013	Low Development	0.025	0.051	0	0.159
		BLM Reference	0.031	0.039	0.002	0.141
		High Development	0.039	0.054	0.002	0.193
	2014	Low Development	0.024	0.045	0	0.146
		BLM Reference	0.032	0.046	0.001	0.161
		High Development	0.038	0.054	0.002	0.2

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Northern Rough-winged Swallow</i>	2015	Low Development	0.024	0.042	0	0.141
		BLM Reference	0.03	0.041	0.002	0.147
		High Development	0.041	0.055	0.002	0.2
	2016	Low Development	0.027	0.056	0	0.183
		BLM Reference	0.03	0.042	0.001	0.143
	2010	High Development	0.039	0.065	0.001	0.224
<i>Northern Rough-winged Swallow</i>	2011	Low Development	0.027	0.054	0	0.176
		BLM Reference	0.032	0.042	0.001	0.147
		High Development	0.086	0.06	0.016	0.247
	2012	Low Development	0.034	0.055	0.001	0.183
		BLM Reference	0.053	0.066	0.003	0.233
	2013	High Development	0.105	0.066	0.025	0.268
<i>Northern Rough-winged Swallow</i>	2014	Low Development	0.029	0.032	0.003	0.121
		BLM Reference	0.051	0.041	0.008	0.162
		High Development	0.115	0.042	0.051	0.215
	2015	Low Development	0.028	0.036	0.002	0.124
		BLM Reference	0.043	0.037	0.006	0.145
	2010	High Development	0.14	0.054	0.059	0.264
<i>Northern Rough-winged Swallow</i>	2011	Low Development	0.03	0.028	0.005	0.106
		BLM Reference	0.046	0.04	0.006	0.152
		High Development	0.131	0.052	0.052	0.254
	2012	Low Development	0.037	0.026	0.008	0.106
		BLM Reference	0.043	0.032	0.007	0.124
	2013	High Development	0.14	0.053	0.057	0.259

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Orange-crowned Warbler</i>	2016	Low Development	0.03	0.029	0.004	0.11
		BLM Reference	0.039	0.032	0.005	0.123
		High Development	0.138	0.066	0.047	0.302
	2010	Low Development	0.033	0.029	0.005	0.113
		BLM Reference	0.038	0.045	0.003	0.158
	2011	High Development	0.049	0.047	0.006	0.173
	2012	Low Development	0.025	0.049	0.001	0.156
		BLM Reference	0.167	0.14	0.016	0.549
		High Development	0.045	0.039	0.007	0.149
	2013	Low Development	0.02	0.032	0.001	0.106
		BLM Reference	0.156	0.093	0.035	0.394
		High Development	0.047	0.031	0.01	0.124
	2014	Low Development	0.02	0.036	0.001	0.108
		BLM Reference	0.154	0.071	0.05	0.322
		High Development	0.05	0.034	0.01	0.137
	2015	Low Development	0.022	0.028	0.002	0.105
		BLM Reference	0.16	0.112	0.027	0.444
		High Development	0.054	0.035	0.011	0.143
	2016	Low Development	0.02	0.028	0.002	0.096
		BLM Reference	0.201	0.102	0.052	0.44
	2015	High Development	0.056	0.045	0.008	0.176
		Low Development	0.021	0.035	0.001	0.113
	2016	BLM Reference	0.16	0.098	0.033	0.401
		High Development	0.071	0.053	0.011	0.212

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Pine Siskin	2010	Low Development	0.025	0.029	0.002	0.107
		BLM Reference	0.128	0.081	0.023	0.33
	2010	High Development	0.062	0.121	0	0.46
		Low Development	0.046	0.115	0	0.401
	2011	BLM Reference	0.061	0.089	0.001	0.328
		High Development	0.056	0.111	0	0.405
		Low Development	0.042	0.108	0	0.391
Pinyon Jay	2012	BLM Reference	0.054	0.07	0.002	0.252
		High Development	0.056	0.11	0	0.405
		Low Development	0.045	0.117	0	0.431
	2013	BLM Reference	0.053	0.065	0.002	0.232
		High Development	0.057	0.115	0	0.425
		Low Development	0.044	0.113	0	0.41
Pinyon Jay	2014	BLM Reference	0.055	0.082	0.001	0.301
		High Development	0.058	0.119	0	0.449
		Low Development	0.045	0.118	0	0.42
	2015	BLM Reference	0.054	0.08	0.001	0.295
		High Development	0.062	0.128	0	0.491
		Low Development	0.05	0.129	0	0.496
Pinyon Jay	2016	BLM Reference	0.056	0.086	0.001	0.314
		High Development	0.061	0.128	0	0.495
	2010	Low Development	0.051	0.131	0	0.519
		BLM Reference	0.059	0.1	0.001	0.36
Pinyon Jay	2010	High Development	0.058	0.117	0	0.414

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.042	0.109	0	0.369
		BLM Reference	0.301	0.173	0.047	0.7
	2011	High Development	0.055	0.11	0	0.408
		Low Development	0.037	0.095	0	0.312
	2012	BLM Reference	0.328	0.063	0.216	0.466
		High Development	0.054	0.111	0	0.41
Cactus Wren	2013	Low Development	0.04	0.105	0	0.369
		BLM Reference	0.368	0.055	0.265	0.48
	2014	High Development	0.055	0.114	0	0.415
		Low Development	0.039	0.103	0	0.344
	2015	BLM Reference	0.444	0.07	0.311	0.584
		High Development	0.056	0.117	0	0.431
Coyote	2016	Low Development	0.04	0.107	0	0.387
		BLM Reference	0.35	0.072	0.228	0.515
	2017	High Development	0.06	0.127	0	0.487
		Low Development	0.044	0.118	0	0.441
	2018	BLM Reference	0.383	0.08	0.244	0.559
		High Development	0.06	0.128	0	0.501
Prairie Falcon	2010	Low Development	0.044	0.118	0	0.434
		BLM Reference	0.44	0.089	0.281	0.629
	2011	High Development	0.055	0.11	0	0.415
		Low Development	0.025	0.052	0	0.156
	2012	BLM Reference	0.045	0.048	0.003	0.175
		High Development	0.052	0.105	0	0.38

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-tailed Hawk	2010	Low Development	0.019	0.031	0.001	0.107
		BLM Reference	0.034	0.033	0.003	0.122
	2012	High Development	0.053	0.108	0	0.396
		Low Development	0.02	0.035	0.001	0.114
	2013	BLM Reference	0.032	0.032	0.003	0.123
		High Development	0.053	0.109	0	0.408
		Low Development	0.019	0.029	0.001	0.101
Red-tailed Hawk	2014	BLM Reference	0.031	0.044	0.002	0.151
		High Development	0.055	0.114	0	0.427
		Low Development	0.02	0.027	0.001	0.097
	2015	BLM Reference	0.03	0.041	0.002	0.145
		High Development	0.059	0.125	0	0.462
		Low Development	0.023	0.032	0.001	0.113
Red-tailed Hawk	2016	BLM Reference	0.029	0.043	0.001	0.149
		High Development	0.059	0.128	0	0.499
		Low Development	0.021	0.033	0.001	0.119
	2011	BLM Reference	0.03	0.052	0.001	0.181
		High Development	0.05	0.056	0.004	0.203
		Low Development	0.021	0.04	0.001	0.12
Red-tailed Hawk	2012	BLM Reference	0.046	0.065	0.002	0.235
		High Development	0.054	0.04	0.008	0.158
		Low Development	0.017	0.026	0.001	0.08
	2012	BLM Reference	0.04	0.041	0.003	0.155
		High Development	0.044	0.036	0.007	0.136

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Red-winged Blackbird</i>	2013	Low Development	0.02	0.026	0.002	0.091
		BLM Reference	0.04	0.045	0.002	0.169
	2014	High Development	0.044	0.032	0.007	0.126
		Low Development	0.016	0.021	0.002	0.071
	2015	BLM Reference	0.042	0.055	0.002	0.197
		High Development	0.044	0.033	0.007	0.13
		Low Development	0.017	0.019	0.002	0.07
<i>Red-winged Blackbird</i>	2016	BLM Reference	0.045	0.053	0.002	0.2
		High Development	0.053	0.037	0.01	0.145
		Low Development	0.018	0.021	0.002	0.079
	2010	BLM Reference	0.042	0.058	0.002	0.214
		High Development	0.044	0.041	0.006	0.156
		Low Development	0.019	0.022	0.002	0.078
<i>Red-winged Blackbird</i>	2011	BLM Reference	0.046	0.073	0.001	0.268
		High Development	0.054	0.039	0.009	0.153
		Low Development	0.025	0.037	0.002	0.108
	2012	BLM Reference	0.087	0.051	0.022	0.217
		High Development	0.059	0.031	0.017	0.135
		Low Development	0.025	0.021	0.004	0.081
<i>Red-winged Blackbird</i>	2013	BLM Reference	0.106	0.036	0.049	0.189
		High Development	0.065	0.036	0.018	0.156
	2013	Low Development	0.025	0.023	0.004	0.088
		BLM Reference	0.13	0.04	0.067	0.223

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Ring-necked Pheasant	2014	Low Development	0.023	0.017	0.005	0.069
		BLM Reference	0.117	0.039	0.057	0.207
	2015	High Development	0.097	0.051	0.027	0.221
		Low Development	0.028	0.017	0.008	0.072
	2016	BLM Reference	0.127	0.033	0.073	0.201
		High Development	0.079	0.05	0.016	0.21
		Low Development	0.03	0.026	0.006	0.101
Ring-necked Pheasant	2010	BLM Reference	0.097	0.03	0.05	0.165
		High Development	0.113	0.062	0.029	0.263
		Low Development	0.03	0.022	0.007	0.088
	2011	BLM Reference	0.081	0.039	0.028	0.181
		High Development	0.058	0.116	0	0.428
		Low Development	0.041	0.109	0	0.371
Ring-necked Pheasant	2012	BLM Reference	0.086	0.117	0.002	0.452
		High Development	0.055	0.111	0	0.41
		Low Development	0.036	0.098	0	0.326
	2013	BLM Reference	0.077	0.09	0.004	0.343
		High Development	0.054	0.111	0	0.414
		Low Development	0.038	0.106	0	0.358
Ring-necked Pheasant	2014	BLM Reference	0.078	0.088	0.004	0.329
		High Development	0.054	0.114	0	0.429
	2014	Low Development	0.037	0.103	0	0.343
		BLM Reference	0.081	0.096	0.003	0.366
	2014	High Development	0.055	0.118	0	0.461

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rock Pigeon	2015	Low Development	0.038	0.104	0	0.356
		BLM Reference	0.081	0.089	0.004	0.331
		High Development	0.058	0.127	0	0.483
	2016	Low Development	0.041	0.113	0	0.402
		BLM Reference	0.082	0.087	0.005	0.325
	2010	High Development	0.058	0.129	0	0.498
Rock Pigeon	2011	Low Development	0.042	0.114	0	0.426
		BLM Reference	0.089	0.075	0.007	0.286
		High Development	0.06	0.115	0	0.429
	2012	Low Development	0.043	0.106	0	0.372
		BLM Reference	0.034	0.036	0.002	0.131
		High Development	0.056	0.107	0	0.389
Rock Pigeon	2013	Low Development	0.039	0.098	0	0.34
		BLM Reference	0.028	0.03	0.002	0.107
		High Development	0.056	0.109	0	0.398
	2014	Low Development	0.042	0.106	0	0.384
		BLM Reference	0.026	0.029	0.002	0.105
		High Development	0.056	0.111	0	0.425
Rock Pigeon	2015	Low Development	0.042	0.106	0	0.376
		BLM Reference	0.028	0.03	0.002	0.112
	2015	High Development	0.058	0.115	0	0.432
		Low Development	0.043	0.109	0	0.407

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rock Wren	2016	Low Development	0.048	0.123	0	0.462
		BLM Reference	0.024	0.031	0.001	0.11
		High Development	0.063	0.128	0	0.476
	2010	Low Development	0.049	0.124	0	0.464
		BLM Reference	0.025	0.04	0.001	0.137
	2011	High Development	0.2	0.138	0.023	0.539
2012	2011	Low Development	0.198	0.161	0.018	0.62
		BLM Reference	0.208	0.065	0.125	0.369
		High Development	0.329	0.058	0.22	0.448
	2013	Low Development	0.173	0.093	0.045	0.399
		BLM Reference	0.31	0.03	0.254	0.368
		High Development	0.207	0.05	0.121	0.314
2014	2012	Low Development	0.164	0.117	0.027	0.477
		BLM Reference	0.208	0.026	0.159	0.262
		High Development	0.144	0.04	0.075	0.231
	2015	Low Development	0.239	0.084	0.103	0.43
		BLM Reference	0.183	0.026	0.133	0.236
		High Development	0.179	0.033	0.119	0.247
2016	2014	Low Development	0.141	0.042	0.071	0.231
		BLM Reference	0.371	0.033	0.307	0.436
	2015	High Development	0.183	0.041	0.11	0.267
		Low Development	0.12	0.053	0.04	0.243
	2016	BLM Reference	0.348	0.034	0.284	0.417
	2016	High Development	0.134	0.036	0.073	0.214

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Rufous Hummingbird	2010	Low Development	0.126	0.049	0.05	0.239
		BLM Reference	0.243	0.026	0.193	0.296
		High Development	0.163	0.086	0.044	0.365
	2011	Low Development	0.048	0.12	0	0.427
		BLM Reference	0.247	0.139	0.062	0.61
	2012	High Development	0.19	0.076	0.073	0.364
Sagebrush Sparrow	2013	Low Development	0.042	0.107	0	0.374
		BLM Reference	0.333	0.16	0.088	0.701
		High Development	0.201	0.094	0.064	0.429
	2014	Low Development	0.046	0.116	0	0.416
		BLM Reference	0.358	0.165	0.099	0.717
		High Development	0.225	0.076	0.098	0.395
Sagebrush Sparrow	2015	Low Development	0.045	0.114	0	0.401
		BLM Reference	0.385	0.193	0.079	0.796
		High Development	0.235	0.101	0.081	0.475
	2016	Low Development	0.046	0.117	0	0.422
		BLM Reference	0.492	0.164	0.192	0.816
		High Development	0.281	0.11	0.108	0.527
Sagebrush Sparrow	2010	Low Development	0.051	0.127	0	0.472
		BLM Reference	0.437	0.192	0.116	0.826
		High Development	0.278	0.118	0.099	0.553
Sagebrush Sparrow	2010	Low Development	0.052	0.13	0	0.514
		BLM Reference	0.414	0.209	0.091	0.869
		High Development	0.247	0.049	0.159	0.349

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Sage Thrasher	2010	Low Development	0.364	0.089	0.203	0.549
		BLM Reference	0.513	0.029	0.454	0.571
	2011	High Development	0.368	0.057	0.261	0.484
		Low Development	0.23	0.07	0.112	0.381
	2012	BLM Reference	0.54	0.031	0.479	0.601
		High Development	0.238	0.042	0.157	0.324
		Low Development	0.138	0.049	0.057	0.248
Sage Thrasher	2013	BLM Reference	0.596	0.031	0.534	0.656
		High Development	0.305	0.066	0.185	0.445
		Low Development	0.291	0.104	0.125	0.53
	2014	BLM Reference	0.559	0.033	0.492	0.622
		High Development	0.356	0.05	0.262	0.457
		Low Development	0.225	0.063	0.112	0.359
Sage Thrasher	2015	BLM Reference	0.678	0.036	0.606	0.746
		High Development	0.222	0.045	0.139	0.316
		Low Development	0.227	0.058	0.124	0.351
	2016	BLM Reference	0.693	0.026	0.641	0.743
		High Development	0.252	0.042	0.175	0.337
		Low Development	0.31	0.077	0.169	0.467
Sage Thrasher	2010	BLM Reference	0.669	0.024	0.621	0.716
		High Development	0.51	0.046	0.42	0.6
		Low Development	0.31	0.085	0.159	0.488
	2011	BLM Reference	0.355	0.029	0.3	0.413
Sage Thrasher	2011	High Development	0.469	0.045	0.382	0.559

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Savannah Sparrow	2010	Low Development	0.269	0.051	0.175	0.377
		BLM Reference	0.359	0.026	0.309	0.413
	2012	High Development	0.453	0.042	0.373	0.536
		Low Development	0.252	0.074	0.121	0.41
	2013	BLM Reference	0.304	0.024	0.258	0.352
		High Development	0.234	0.042	0.154	0.321
Savannah Sparrow	2014	Low Development	0.177	0.049	0.091	0.28
		BLM Reference	0.322	0.028	0.267	0.378
	2015	High Development	0.222	0.036	0.156	0.293
		Low Development	0.27	0.05	0.178	0.376
	2016	BLM Reference	0.29	0.031	0.231	0.353
		High Development	0.448	0.042	0.365	0.532
Savannah Sparrow	2010	Low Development	0.208	0.05	0.12	0.313
		BLM Reference	0.439	0.026	0.388	0.492
	2011	High Development	0.278	0.035	0.213	0.349
		Low Development	0.215	0.043	0.138	0.303
	2012	BLM Reference	0.434	0.023	0.389	0.478
		High Development	0.063	0.049	0.008	0.192
Savannah Sparrow	2010	Low Development	0.147	0.175	0.003	0.659
		BLM Reference	0.041	0.036	0.005	0.136
	2011	High Development	0.07	0.056	0.01	0.221
		Low Development	0.137	0.154	0.004	0.581
	2012	BLM Reference	0.044	0.03	0.008	0.122
		High Development	0.074	0.047	0.016	0.193

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Say's Phoebe	2013	Low Development	0.162	0.149	0.007	0.552
		BLM Reference	0.043	0.03	0.007	0.121
	2014	High Development	0.081	0.049	0.018	0.203
		Low Development	0.144	0.164	0.003	0.614
	2015	BLM Reference	0.04	0.031	0.006	0.121
		High Development	0.096	0.064	0.018	0.259
		Low Development	0.148	0.171	0.003	0.633
Say's Phoebe	2016	BLM Reference	0.05	0.046	0.006	0.178
		High Development	0.111	0.087	0.014	0.345
		Low Development	0.159	0.192	0.002	0.723
	2010	BLM Reference	0.04	0.044	0.004	0.164
		High Development	0.138	0.079	0.028	0.332
		Low Development	0.164	0.195	0.002	0.721
Say's Phoebe	2011	BLM Reference	0.04	0.058	0.002	0.2
		High Development	0.04	0.029	0.008	0.118
		Low Development	0.035	0.07	0.001	0.235
	2012	BLM Reference	0.124	0.043	0.056	0.223
		High Development	0.029	0.022	0.006	0.09
		Low Development	0.03	0.046	0.001	0.171
Say's Phoebe	2013	BLM Reference	0.077	0.03	0.032	0.149
		High Development	0.023	0.018	0.005	0.072
	2013	Low Development	0.034	0.055	0.001	0.205
		BLM Reference	0.075	0.031	0.03	0.15

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Greater Sage-Grouse	2013	Low Development	0.029	0.056	0.001	0.194
		BLM Reference	0.132	0.044	0.063	0.23
	2014	High Development	0.025	0.017	0.006	0.071
		Low Development	0.029	0.058	0.001	0.198
	2015	BLM Reference	0.063	0.026	0.024	0.124
		High Development	0.026	0.02	0.006	0.079
Sharp-tailed Grouse	2016	Low Development	0.032	0.072	0	0.24
		BLM Reference	0.077	0.029	0.033	0.144
	2017	High Development	0.019	0.017	0.003	0.066
		Low Development	0.032	0.073	0	0.253
	2018	BLM Reference	0.059	0.028	0.022	0.128
		High Development	0.034	0.053	0.001	0.177
Greater Prairie-Chicken	2010	Low Development	0.045	0.113	0	0.399
		BLM Reference	0.08	0.139	0.001	0.546
	2011	High Development	0.031	0.039	0.001	0.143
		Low Development	0.041	0.104	0	0.367
	2012	BLM Reference	0.074	0.128	0.001	0.496
		High Development	0.029	0.043	0.001	0.148
Spruce Grouse	2013	Low Development	0.044	0.114	0	0.421
		BLM Reference	0.075	0.131	0.001	0.502
	2014	High Development	0.03	0.047	0.001	0.156
		Low Development	0.043	0.11	0	0.386
	2015	BLM Reference	0.079	0.142	0.001	0.558
		High Development	0.03	0.05	0.001	0.165

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Short-eared Owl	2015	Low Development	0.044	0.114	0	0.408
		BLM Reference	0.079	0.143	0.001	0.551
	2015	High Development	0.032	0.059	0	0.204
		Low Development	0.048	0.126	0	0.472
	2016	BLM Reference	0.081	0.149	0.001	0.599
		High Development	0.032	0.063	0	0.211
		Low Development	0.05	0.128	0	0.483
Short-eared Owl	2010	BLM Reference	0.088	0.163	0	0.653
		High Development	0.04	0.071	0.001	0.248
		Low Development	0.044	0.109	0	0.4
	2011	BLM Reference	0.064	0.1	0.001	0.369
		High Development	0.035	0.058	0.001	0.197
		Low Development	0.039	0.097	0	0.351
Short-eared Owl	2012	BLM Reference	0.056	0.081	0.002	0.285
		High Development	0.034	0.054	0.001	0.187
		Low Development	0.041	0.106	0	0.387
	2013	BLM Reference	0.055	0.079	0.002	0.281
		High Development	0.034	0.053	0.001	0.176
		Low Development	0.041	0.107	0	0.375
Short-eared Owl	2014	BLM Reference	0.057	0.085	0.002	0.317
		High Development	0.034	0.053	0.001	0.183
		Low Development	0.043	0.11	0	0.391
	2015	BLM Reference	0.055	0.077	0.002	0.289
		High Development	0.035	0.058	0.001	0.192

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Song Sparrow	2016	Low Development	0.047	0.123	0	0.452
		BLM Reference	0.055	0.077	0.002	0.284
		High Development	0.035	0.051	0.001	0.163
	2010	Low Development	0.048	0.124	0	0.462
		BLM Reference	0.058	0.073	0.002	0.262
	2011	High Development	0.078	0.052	0.016	0.211
Song Sparrow	2011	Low Development	0.047	0.115	0	0.418
		BLM Reference	0.12	0.075	0.025	0.304
		High Development	0.087	0.038	0.031	0.178
	2012	Low Development	0.043	0.107	0	0.379
		BLM Reference	0.203	0.058	0.104	0.33
		High Development	0.113	0.046	0.045	0.224
Song Sparrow	2013	Low Development	0.046	0.115	0	0.41
		BLM Reference	0.182	0.061	0.082	0.323
		High Development	0.169	0.061	0.073	0.313
	2014	Low Development	0.045	0.112	0	0.398
		BLM Reference	0.235	0.058	0.133	0.361
		High Development	0.164	0.052	0.078	0.284
Song Sparrow	2015	Low Development	0.046	0.116	0	0.403
		BLM Reference	0.255	0.062	0.148	0.391
		High Development	0.161	0.056	0.069	0.288
	2016	Low Development	0.052	0.13	0	0.502
		BLM Reference	0.285	0.059	0.175	0.407
		High Development	0.206	0.064	0.098	0.351

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Spotted Towhee	2010	Low Development	0.051	0.129	0	0.479
		BLM Reference	0.198	0.079	0.068	0.374
	2010	High Development	0.079	0.076	0.008	0.281
		Low Development	0.034	0.061	0.001	0.206
	2011	BLM Reference	0.092	0.095	0.007	0.369
		High Development	0.087	0.05	0.021	0.211
2012	2011	Low Development	0.028	0.041	0.002	0.146
		BLM Reference	0.084	0.06	0.016	0.246
	2012	High Development	0.08	0.045	0.021	0.191
		Low Development	0.03	0.045	0.001	0.152
	2013	BLM Reference	0.086	0.049	0.021	0.207
		High Development	0.095	0.046	0.029	0.207
2014	2013	Low Development	0.03	0.038	0.002	0.134
		BLM Reference	0.127	0.083	0.025	0.34
	2014	High Development	0.088	0.048	0.024	0.207
		Low Development	0.031	0.035	0.003	0.128
	2015	BLM Reference	0.074	0.044	0.017	0.182
		High Development	0.164	0.072	0.054	0.329
2016	2015	Low Development	0.037	0.031	0.004	0.12
		BLM Reference	0.071	0.042	0.015	0.175
	2016	High Development	0.097	0.044	0.032	0.2
		Low Development	0.04	0.039	0.004	0.149
	Swainson's Hawk	BLM Reference	0.073	0.048	0.014	0.197
		High Development	0.043	0.075	0.001	0.262

Common Name	Year	Contrast	Mean	SD	LCL	UCL
		Low Development	0.022	0.041	0.001	0.132
		BLM Reference	0.081	0.14	0.001	0.545
	2011	High Development	0.04	0.063	0.001	0.215
		Low Development	0.018	0.024	0.001	0.082
		BLM Reference	0.076	0.128	0.001	0.499
		High Development	0.038	0.058	0.001	0.203
	2012	Low Development	0.017	0.027	0.001	0.083
		BLM Reference	0.076	0.132	0.001	0.509
		High Development	0.037	0.055	0.001	0.195
		Low Development	0.015	0.022	0.001	0.071
	2013	BLM Reference	0.081	0.143	0.001	0.56
		High Development	0.037	0.055	0.001	0.19
		Low Development	0.015	0.02	0.001	0.069
		BLM Reference	0.081	0.145	0.001	0.577
	2014	High Development	0.04	0.065	0.001	0.232
		Low Development	0.018	0.022	0.001	0.078
		BLM Reference	0.083	0.149	0.001	0.576
		High Development	0.04	0.055	0.001	0.193
	2015	Low Development	0.017	0.021	0.001	0.077
		BLM Reference	0.089	0.164	0	0.64
Townsend's Solitaire	2010	High Development	0.037	0.061	0.001	0.209
		Low Development	0.021	0.043	0	0.128
	2011	BLM Reference	0.333	0.081	0.195	0.518
		High Development	0.034	0.049	0.001	0.177

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Bluebird	2012	Low Development	0.017	0.025	0.001	0.086
		BLM Reference	0.281	0.051	0.189	0.388
	2013	High Development	0.032	0.045	0.001	0.156
		Low Development	0.017	0.028	0.001	0.086
	2014	BLM Reference	0.215	0.062	0.116	0.363
		High Development	0.032	0.042	0.002	0.152
Brewer's Sparrow	2015	Low Development	0.016	0.023	0.001	0.077
		BLM Reference	0.141	0.074	0.044	0.326
	2016	High Development	0.031	0.04	0.002	0.15
		Low Development	0.018	0.022	0.002	0.08
	2010	BLM Reference	0.282	0.062	0.177	0.416
		High Development	0.032	0.05	0.001	0.175
Chipping Sparrow	2015	Low Development	0.021	0.027	0.001	0.099
		BLM Reference	0.259	0.053	0.17	0.377
	2016	High Development	0.032	0.05	0.001	0.179
		Low Development	0.019	0.024	0.002	0.086
	2011	BLM Reference	0.301	0.087	0.158	0.499
		High Development	0.03	0.045	0.001	0.151
Tree Swallow	2010	Low Development	0.047	0.117	0	0.439
		BLM Reference	0.04	0.046	0.004	0.164
	2012	High Development	0.033	0.058	0.001	0.186
		Low Development	0.042	0.106	0	0.384
Worm-eating Warbler	2012	BLM Reference	0.045	0.03	0.011	0.124
		High Development	0.028	0.039	0.001	0.134

Common Name	Year	Contrast	Mean	SD	LCL	UCL
American Kestrel	2013	Low Development	0.044	0.113	0	0.418
		BLM Reference	0.043	0.024	0.012	0.102
	2013	High Development	0.028	0.038	0.001	0.134
		Low Development	0.044	0.113	0	0.41
	2014	BLM Reference	0.088	0.041	0.03	0.19
		High Development	0.028	0.036	0.001	0.128
Burrowing Owl	2014	Low Development	0.045	0.114	0	0.42
		BLM Reference	0.053	0.029	0.015	0.126
	2015	High Development	0.031	0.036	0.002	0.132
		Low Development	0.05	0.126	0	0.493
	2016	BLM Reference	0.044	0.026	0.012	0.108
		High Development	0.03	0.037	0.002	0.133
Burrowing Owl	2016	Low Development	0.05	0.127	0	0.487
		BLM Reference	0.037	0.03	0.006	0.116
	2010	High Development	0.29	0.112	0.11	0.552
		Low Development	0.043	0.113	0	0.399
	2011	BLM Reference	0.082	0.09	0.005	0.338
		High Development	0.153	0.087	0.035	0.368
Turkey Vulture	2011	Low Development	0.038	0.104	0	0.358
		BLM Reference	0.075	0.06	0.01	0.235
	2012	High Development	0.13	0.053	0.047	0.251
		Low Development	0.041	0.111	0	0.383
	2013	BLM Reference	0.08	0.053	0.013	0.213
		High Development	0.122	0.061	0.036	0.269

Common Name	Year	Contrast	Mean	SD	LCL	UCL
<i>Greater Prairie-Chicken</i>	2014	Low Development	0.039	0.109	0	0.384
		BLM Reference	0.067	0.051	0.009	0.198
	2014	High Development	0.098	0.054	0.027	0.233
		Low Development	0.041	0.112	0	0.408
	2015	BLM Reference	0.076	0.063	0.009	0.243
		High Development	0.088	0.072	0.012	0.28
<i>Upland Sandpiper</i>	2016	Low Development	0.044	0.12	0	0.434
		BLM Reference	0.073	0.07	0.007	0.268
	2016	High Development	0.079	0.051	0.017	0.209
		Low Development	0.045	0.123	0	0.465
	2010	BLM Reference	0.075	0.088	0.004	0.326
		High Development	0.063	0.12	0	0.467
<i>Greater Prairie-Chicken</i>	2011	Low Development	0.043	0.112	0	0.402
		BLM Reference	0.065	0.084	0.003	0.307
	2011	High Development	0.059	0.113	0	0.422
		Low Development	0.039	0.101	0	0.349
	2012	BLM Reference	0.059	0.058	0.006	0.22
		High Development	0.058	0.114	0	0.426
<i>Greater Prairie-Chicken</i>	2013	Low Development	0.041	0.107	0	0.362
		BLM Reference	0.059	0.05	0.006	0.192
	2013	High Development	0.059	0.116	0	0.45
		Low Development	0.041	0.109	0	0.381
	2014	BLM Reference	0.066	0.068	0.005	0.253
		High Development	0.061	0.121	0	0.465

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Vesper Sparrow	2015	Low Development	0.042	0.112	0	0.413
		BLM Reference	0.067	0.064	0.006	0.244
		High Development	0.064	0.13	0	0.497
	2016	Low Development	0.047	0.124	0	0.484
		BLM Reference	0.07	0.069	0.006	0.26
	2010	High Development	0.065	0.132	0	0.509
Vesper Sparrow	2011	Low Development	0.047	0.126	0	0.49
		BLM Reference	0.09	0.077	0.008	0.292
		High Development	0.453	0.04	0.375	0.533
	2012	Low Development	0.39	0.063	0.272	0.517
		BLM Reference	0.464	0.029	0.409	0.522
		High Development	0.39	0.042	0.31	0.473
Vesper Sparrow	2013	Low Development	0.469	0.048	0.375	0.565
		BLM Reference	0.434	0.026	0.382	0.485
		High Development	0.573	0.036	0.503	0.644
	2014	Low Development	0.594	0.042	0.513	0.673
		BLM Reference	0.414	0.025	0.366	0.464
		High Development	0.489	0.042	0.407	0.573
Vesper Sparrow	2015	Low Development	0.493	0.04	0.415	0.57
		BLM Reference	0.398	0.027	0.346	0.452
	2015	High Development	0.504	0.035	0.434	0.573
		Low Development	0.558	0.037	0.484	0.628

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Violet-green Swallow	2016	Low Development	0.745	0.035	0.675	0.811
		BLM Reference	0.454	0.025	0.406	0.504
		High Development	0.557	0.033	0.492	0.62
	2010	Low Development	0.61	0.034	0.54	0.676
		BLM Reference	0.538	0.023	0.492	0.583
	2011	High Development	0.06	0.116	0	0.433
2012	2011	Low Development	0.029	0.061	0	0.211
		BLM Reference	0.058	0.091	0.001	0.337
		High Development	0.057	0.111	0	0.4
	2013	Low Development	0.023	0.044	0	0.149
		BLM Reference	0.051	0.07	0.002	0.257
		High Development	0.056	0.112	0	0.404
2014	2012	Low Development	0.023	0.045	0	0.148
		BLM Reference	0.05	0.069	0.002	0.252
		High Development	0.057	0.114	0	0.424
	2015	Low Development	0.022	0.041	0	0.136
		BLM Reference	0.053	0.079	0.001	0.291
		High Development	0.058	0.118	0	0.436
2016	2014	Low Development	0.023	0.038	0	0.135
		BLM Reference	0.051	0.066	0.002	0.238
		High Development	0.062	0.129	0	0.476
	2015	Low Development	0.025	0.051	0	0.166
		BLM Reference	0.052	0.078	0.001	0.288
		High Development	0.062	0.129	0	0.486

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Warbling Vireo	2010	Low Development	0.025	0.05	0	0.162
		BLM Reference	0.057	0.095	0.001	0.346
	2010	High Development	0.085	0.062	0.013	0.245
		Low Development	0.043	0.111	0	0.414
	2011	BLM Reference	0.043	0.058	0.003	0.205
		High Development	0.098	0.07	0.017	0.281
Western Kingbird	2012	Low Development	0.038	0.097	0	0.328
		BLM Reference	0.041	0.037	0.005	0.137
	2012	High Development	0.098	0.064	0.021	0.26
		Low Development	0.041	0.107	0	0.388
	2013	BLM Reference	0.044	0.034	0.007	0.134
		High Development	0.128	0.062	0.037	0.273
	2014	Low Development	0.041	0.107	0	0.367
		BLM Reference	0.039	0.04	0.004	0.14
	2015	High Development	0.101	0.051	0.028	0.224
		Low Development	0.042	0.111	0	0.398
	2016	BLM Reference	0.045	0.03	0.008	0.123
		High Development	0.095	0.055	0.021	0.235
	2010	Low Development	0.047	0.121	0	0.448
		BLM Reference	0.048	0.035	0.008	0.134
	2010	High Development	0.127	0.065	0.033	0.281
		Low Development	0.047	0.122	0	0.463
		BLM Reference	0.041	0.047	0.003	0.162
Western Kingbird	2010	High Development	0.034	0.047	0.002	0.168

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Burrowing Owl	2010	Low Development	0.028	0.052	0.001	0.176
		BLM Reference	0.035	0.052	0.001	0.181
	2011	High Development	0.032	0.035	0.002	0.131
		Low Development	0.024	0.034	0.001	0.118
	2012	BLM Reference	0.032	0.031	0.003	0.113
		High Development	0.031	0.034	0.002	0.127
Burrowing Owl	2013	Low Development	0.022	0.038	0.001	0.127
		BLM Reference	0.028	0.03	0.002	0.111
	2014	High Development	0.029	0.039	0.002	0.137
		Low Development	0.02	0.033	0.001	0.109
	2015	BLM Reference	0.027	0.035	0.002	0.125
		High Development	0.029	0.042	0.001	0.143
Burrowing Owl	2016	Low Development	0.021	0.03	0.001	0.108
		BLM Reference	0.027	0.033	0.002	0.118
	2017	High Development	0.03	0.051	0.001	0.176
		Low Development	0.021	0.04	0	0.132
	2018	BLM Reference	0.027	0.031	0.002	0.113
		High Development	0.03	0.052	0.001	0.165
Western Meadowlark	2010	Low Development	0.021	0.038	0.001	0.127
		BLM Reference	0.026	0.041	0.001	0.144
	2011	High Development	0.371	0.054	0.271	0.477
		Low Development	0.181	0.081	0.056	0.371
	2012	BLM Reference	0.476	0.053	0.373	0.581
		High Development	0.299	0.044	0.216	0.389

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Mountain Bluebird	2012	Low Development	0.188	0.058	0.089	0.317
		BLM Reference	0.376	0.034	0.312	0.444
	2013	High Development	0.301	0.039	0.229	0.38
		Low Development	0.209	0.099	0.057	0.434
	2014	BLM Reference	0.315	0.036	0.246	0.387
		High Development	0.373	0.052	0.277	0.48
Blue Grosbeak	2015	Low Development	0.253	0.049	0.161	0.357
		BLM Reference	0.376	0.044	0.293	0.464
	2016	High Development	0.239	0.044	0.16	0.332
		Low Development	0.312	0.041	0.234	0.396
	2017	BLM Reference	0.377	0.049	0.283	0.475
		High Development	0.302	0.048	0.213	0.4
Western Wood-Pewee	2010	Low Development	0.276	0.045	0.194	0.367
		BLM Reference	0.51	0.033	0.446	0.575
	2011	High Development	0.194	0.039	0.121	0.274
		Low Development	0.312	0.038	0.24	0.389
	2012	BLM Reference	0.327	0.031	0.266	0.389
		High Development	0.057	0.078	0.001	0.287
Warbling Vireo	2010	Low Development	0.043	0.112	0	0.393
		BLM Reference	0.083	0.141	0.001	0.546
	2011	High Development	0.049	0.08	0.001	0.29
		Low Development	0.038	0.101	0	0.347
	2012	BLM Reference	0.076	0.128	0.001	0.504
		High Development	0.047	0.08	0.001	0.277

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Red-breasted Nuthatch	2013	Low Development	0.039	0.105	0	0.359
		BLM Reference	0.077	0.132	0.001	0.502
	2013	High Development	0.046	0.082	0.001	0.299
		Low Development	0.039	0.105	0	0.36
	2014	BLM Reference	0.08	0.14	0.001	0.544
		High Development	0.046	0.086	0.001	0.292
White-breasted Nuthatch	2015	Low Development	0.04	0.109	0	0.382
		BLM Reference	0.081	0.144	0.001	0.555
	2015	High Development	0.049	0.097	0	0.345
		Low Development	0.045	0.12	0	0.443
	2016	BLM Reference	0.083	0.148	0.001	0.573
		High Development	0.048	0.098	0	0.358
White-breasted Nuthatch	2010	Low Development	0.045	0.12	0	0.452
		BLM Reference	0.089	0.161	0.001	0.63
	2011	High Development	0.057	0.113	0	0.407
		Low Development	0.047	0.116	0	0.447
	2011	BLM Reference	0.031	0.049	0.001	0.175
		High Development	0.054	0.107	0	0.386
White-breasted Nuthatch	2012	Low Development	0.042	0.103	0	0.382
		BLM Reference	0.028	0.032	0.002	0.114
	2012	High Development	0.054	0.108	0	0.388
		Low Development	0.046	0.113	0	0.431
	2013	BLM Reference	0.027	0.03	0.002	0.109
		High Development	0.054	0.11	0	0.405

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Wilson's Snipe	2014	Low Development	0.044	0.11	0	0.405
		BLM Reference	0.03	0.031	0.002	0.112
		High Development	0.056	0.115	0	0.419
	2015	Low Development	0.045	0.114	0	0.417
		BLM Reference	0.029	0.028	0.003	0.105
	2016	High Development	0.059	0.125	0	0.466
Wilson's Snipe	2010	Low Development	0.05	0.126	0	0.487
		BLM Reference	0.028	0.03	0.002	0.11
		High Development	0.06	0.129	0	0.509
	2011	Low Development	0.05	0.126	0	0.468
		BLM Reference	0.034	0.034	0.003	0.12
		High Development	0.06	0.076	0.002	0.28
Wilson's Snipe	2012	Low Development	0.043	0.109	0	0.375
		BLM Reference	0.083	0.089	0.007	0.339
		High Development	0.05	0.072	0.002	0.256
	2013	Low Development	0.038	0.097	0	0.328
		BLM Reference	0.074	0.053	0.014	0.214
		High Development	0.047	0.068	0.002	0.247
Wilson's Snipe	2014	Low Development	0.041	0.106	0	0.37
		BLM Reference	0.084	0.042	0.024	0.187
	2014	High Development	0.048	0.065	0.002	0.229
		Low Development	0.04	0.104	0	0.371

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Yellow Warbler	2015	Low Development	0.041	0.108	0	0.377
		BLM Reference	0.06	0.039	0.012	0.157
		High Development	0.048	0.083	0.001	0.295
	2016	Low Development	0.045	0.119	0	0.434
		BLM Reference	0.057	0.036	0.012	0.146
	2010	High Development	0.047	0.082	0.001	0.285
Yellow Warbler	2011	Low Development	0.046	0.12	0	0.454
		BLM Reference	0.056	0.06	0.005	0.22
		High Development	0.102	0.062	0.023	0.257
	2012	Low Development	0.069	0.102	0.001	0.372
		BLM Reference	0.153	0.091	0.032	0.376
		High Development	0.088	0.042	0.028	0.185
Yellow Warbler	2013	Low Development	0.058	0.072	0.002	0.261
		BLM Reference	0.236	0.095	0.087	0.454
		High Development	0.087	0.045	0.025	0.198
	2014	Low Development	0.066	0.061	0.003	0.224
		BLM Reference	0.283	0.074	0.152	0.442
		High Development	0.096	0.051	0.026	0.219
Yellow Warbler	2015	Low Development	0.06	0.08	0.002	0.287
		BLM Reference	0.272	0.079	0.139	0.448
	2015	High Development	0.079	0.055	0.015	0.22
		Low Development	0.061	0.082	0.002	0.304

Common Name	Year	Contrast	Mean	SD	LCL	UCL
Yellow-rumped Warbler	2016	Low Development	0.069	0.104	0.001	0.391
		BLM Reference	0.17	0.055	0.081	0.293
		High Development	0.078	0.062	0.011	0.239
	2010	Low Development	0.071	0.105	0.001	0.39
		BLM Reference	0.156	0.082	0.042	0.357
	2011	High Development	0.034	0.044	0.001	0.15
	2012	Low Development	0.044	0.113	0	0.409
		BLM Reference	0.084	0.142	0.001	0.546
		High Development	0.032	0.05	0.001	0.169
	2013	Low Development	0.039	0.102	0	0.338
		BLM Reference	0.077	0.131	0.001	0.513
		High Development	0.03	0.05	0.001	0.165
	2014	Low Development	0.041	0.11	0	0.387
		BLM Reference	0.077	0.133	0.001	0.528
		High Development	0.03	0.052	0.001	0.174
	2015	Low Development	0.04	0.107	0	0.366
		BLM Reference	0.081	0.141	0.001	0.539
		High Development	0.03	0.057	0.001	0.187
	2016	Low Development	0.042	0.112	0	0.393
		BLM Reference	0.081	0.142	0.001	0.549
	2015	High Development	0.033	0.067	0	0.212
		Low Development	0.045	0.122	0	0.47
	2016	BLM Reference	0.083	0.148	0.001	0.586
		High Development	0.033	0.069	0	0.227

Common Name	Year	Contrast	Mean	SD	LCL	UCL
		Low Development	0.046	0.124	0	0.467
		BLM Reference	0.089	0.161	0.001	0.636

APPENDIX C. ESTIMATES OF MEAN SPECIES RICHNESS (MEAN), STANDARD DEVIATION (SD), AND LOWER (LCL) AND UPPER (UCL) 95% CREDIBLE LIMITS, RESPECTIVELY FOR GUILDS BY YEAR AND CONTRAST, WYOMING, 2010 – 2016.

Guild	Year	Contrast	Mean	SD	LCL	UCL
Generalist	2010	High Development	2.63	0.57	1.64	3.88
		Low Development	3.36	0.95	1.67	5.39
		BLM Reference	1.4	0.28	0.94	2.06
	2011	High Development	2.79	0.59	1.8	4.08
		Low Development	3.85	0.92	2.21	5.77
		BLM Reference	1.47	0.27	1.02	2.1
	2012	High Development	2.93	0.53	2.05	4.12
		Low Development	3.93	0.91	2.3	5.82
		BLM Reference	1.58	0.27	1.13	2.22
2013	High Development	3.08	0.54	2.2	4.32	
		Low Development	4.36	0.85	2.83	6.11
		BLM Reference	1.62	0.28	1.16	2.29
	2014	High Development	3.05	0.54	2.18	4.28
		Low Development	4.87	0.87	3.31	6.67
		BLM Reference	1.86	0.32	1.34	2.61
2015	High Development	3.48	0.58	2.53	4.81	
		Low Development	5.26	0.91	3.63	7.14
		BLM Reference	1.96	0.32	1.43	2.69
	2016	High Development	3.43	0.61	2.46	4.85
		Low Development	5.52	0.96	3.78	7.47
		BLM Reference	1.99	0.35	1.4	2.77
Grassland	2010	High Development	5.81	0.96	4.27	7.97
		Low Development	5.97	1.49	3.54	9.41
		BLM Reference	3.46	0.35	2.82	4.22
	2011	High Development	6.02	0.94	4.53	8.15
		Low Development	6.43	1.46	3.99	9.85
		BLM Reference	3.63	0.33	3.04	4.35
	2012	High Development	5.96	0.9	4.53	7.96
		Low Development	6.72	1.5	4.24	10.13
		BLM Reference	3.74	0.33	3.18	4.43
2013	High Development	5.89	0.92	4.44	7.96	
		Low Development	6.71	1.49	4.22	10.06
		BLM Reference	3.71	0.32	3.13	4.41
	2014	High Development	5.91	0.93	4.46	8.03
		Low Development	7.39	1.52	4.84	10.74
		BLM Reference	3.78	0.36	3.14	4.56
	2015	High Development	6.11	0.97	4.57	8.3
		Low Development	7.76	1.59	5.04	11.12
		BLM Reference	4.19	0.37	3.56	5
2016	High Development	6.26	1.01	4.64	8.54	
		Low Development	7.96	1.64	5.15	11.39

Guild	Year	Contrast	Mean	SD	LCL	UCL
Riparian	2010	BLM Reference	4.17	0.4	3.48	5.04
		High Development	2.07	0.61	1.09	3.44
		Low Development	1.76	0.96	0.38	3.97
	2011	BLM Reference	0.58	0.15	0.35	0.94
		High Development	2.15	0.6	1.17	3.49
		Low Development	1.87	0.96	0.46	3.96
	2012	BLM Reference	0.61	0.14	0.4	0.97
		High Development	1.99	0.55	1.1	3.23
		Low Development	2	1	0.5	4.17
	2013	BLM Reference	0.65	0.15	0.43	1.02
		High Development	1.99	0.57	1.07	3.3
		Low Development	2.09	1	0.57	4.23
Sagebrush	2014	BLM Reference	0.65	0.15	0.43	1.03
		High Development	2.01	0.56	1.12	3.28
		Low Development	2.23	1.04	0.63	4.49
	2015	BLM Reference	0.79	0.18	0.52	1.25
		High Development	2.01	0.59	1.06	3.33
		Low Development	2.46	1.09	0.75	4.83
	2016	BLM Reference	0.74	0.17	0.49	1.16
		High Development	2.09	0.62	1.08	3.46
		Low Development	2.67	1.15	0.84	5.21
	2010	BLM Reference	0.75	0.19	0.48	1.22
		High Development	3.09	0.32	2.56	3.78
		Low Development	2.96	0.37	2.32	3.78
Sagebrush	2011	BLM Reference	2.2	0.13	1.94	2.47
		High Development	3.25	0.33	2.69	3.96
		Low Development	3.05	0.33	2.5	3.78
	2012	BLM Reference	2.27	0.12	2.04	2.51
		High Development	3.12	0.29	2.66	3.8
		Low Development	2.76	0.32	2.21	3.48
	2013	BLM Reference	2.21	0.11	1.99	2.42
		High Development	3.09	0.3	2.61	3.77
		Low Development	2.94	0.28	2.48	3.55
	2014	BLM Reference	2.25	0.11	2.03	2.46
		High Development	3.18	0.3	2.72	3.86
		Low Development	3.06	0.27	2.59	3.62
Sagebrush	2015	BLM Reference	2.25	0.13	1.98	2.51
		High Development	3.18	0.31	2.67	3.88
		Low Development	3.19	0.27	2.71	3.73
	2016	BLM Reference	2.4	0.11	2.18	2.62
		High Development	3.29	0.31	2.79	3.97
		Low Development	3.23	0.27	2.74	3.75
	2010	BLM Reference	2.52	0.11	2.3	2.75
		High Development	3.09	0.32	2.56	3.78
		Low Development	2.96	0.37	2.32	3.78

Guild	Year	Contrast	Mean	SD	LCL	UCL
Shrubland	2010	High Development	1.5	0.44	0.78	2.5
		Low Development	1.28	0.63	0.31	2.69
		BLM Reference	1	0.15	0.75	1.35
	2011	High Development	1.71	0.44	0.98	2.71
		Low Development	1.39	0.63	0.41	2.8
		BLM Reference	1.02	0.14	0.79	1.33
	2012	High Development	1.67	0.41	0.99	2.6
		Low Development	1.5	0.65	0.47	2.93
		BLM Reference	1	0.13	0.78	1.3
2013	High Development	1.81	0.43	1.1	2.78	
		Low Development	1.57	0.65	0.52	2.96
		BLM Reference	0.99	0.12	0.78	1.27
	2014	High Development	1.94	0.42	1.25	2.92
		Low Development	1.75	0.68	0.64	3.2
		BLM Reference	1.07	0.15	0.81	1.41
2015	High Development	2.1	0.45	1.36	3.1	
		Low Development	1.92	0.71	0.75	3.41
		BLM Reference	1.05	0.14	0.82	1.36
	2016	High Development	2.1	0.48	1.31	3.17
		Low Development	2.12	0.74	0.85	3.69
		BLM Reference	1.1	0.15	0.86	1.44
Woodland	2010	High Development	3.28	0.98	1.73	5.53
		Low Development	3.83	1.33	1.66	6.89
		BLM Reference	2.05	0.36	1.47	2.9
	2011	High Development	3.39	0.97	1.86	5.65
		Low Development	4.14	1.32	1.98	7.12
		BLM Reference	2.1	0.34	1.55	2.89
	2012	High Development	3.49	0.93	2.05	5.69
		Low Development	4.38	1.33	2.19	7.39
		BLM Reference	2.2	0.34	1.65	2.99
2013	High Development	3.72	0.96	2.24	5.97	
		Low Development	4.68	1.36	2.45	7.79
		BLM Reference	2.21	0.35	1.66	3.02
	2014	High Development	3.78	0.94	2.32	6.06
		Low Development	5.12	1.4	2.84	8.26
		BLM Reference	2.54	0.42	1.86	3.5
	2015	High Development	3.98	0.99	2.43	6.39
		Low Development	5.5	1.48	3.03	8.84
		BLM Reference	2.49	0.39	1.85	3.35
2016	High Development	4.1	1.03	2.51	6.58	
		Low Development	5.72	1.56	3.12	9.2
		BLM Reference	2.49	0.42	1.79	3.39

APPENDIX D. STATISTICAL MODEL FOR ESTIMATING THE TRENDS FOR LARGE-SCALE AND SMALL-SCALE OCCUPANCY, ATLANTIC RIM NATURAL GAS DEVELOPMENT PROJECT AREA, WYOMING, 2010 – 2016.

We used a state-space formulation (Royle and Dorazio 2008) composed of two sub-models for the partially observed processes of large-scale and small-scale occupancy and an observation model for repeated detections (Mordecai et al. 2011). The latent state z_{itk} is the true presence ($z = 1$) or absence ($z = 0$) of species i , year t and grid cell k , and the latent state u_{itkj} is the true presence ($u = 1$) or absence ($u = 0$) of species i , year t , grid cell k and point j . The observations y_{itkj} are the frequency of detections for species i , year t , grid cell k and point j using a removal design for three, two-minute time occasions (MacKenzie et al. 2006, Pavlacky et al. 2012). The state process model is composed of two equations, one for the occupancy state of grid cells $z_{itk} \sim Bernoulli(\Psi_{itk})$, and the other for the occupancy state of point count plots conditional on the occupancy of grid cells $u_{itkj}|z_{itk} \sim Bernoulli(\theta_{itk} \times z_{itk})$. The observation model for the frequency of detections $y_{itkj}|u_{itkj} \sim Binomial(p_{it} \times u_{itkj}, J_{itk})$ is conditional on the occupancy state of point count plots, where J_{itk} is the time occasion in which species i was first detected for year t , grid cell k and point j using the removal design (MacKenzie et al. 2006, Pavlacky et al. 2012). When a species i was not detected $J = 3$.

We used a series of logistic regression equations to model temporal trends for the large-scale (ψ) and small-scale (θ) occupancy of species in the three contrasts (i.e., ARIM-HI, ARIM-LO, and BLM) investigated, and to model year effects on the probability of detecting the species (p):

$$\begin{aligned} logit(\Psi_{its}) &= b_{0is} + \beta_{1is}(t - 1) + \eta_{1its}, \\ logit(\theta_{its}) &= d_{0is} + \beta_{2is}(t - 1) + \eta_{2its}, \\ logit(p_{it}) &= a_{0it}, \end{aligned}$$

where b_{0is} is the intercept for the large-scale occupancy of species i and contrast s , d_{0is} is the intercept for the small-scale occupancy of species i and contrast s , and a_{0it} is the intercept for the detection of species i and year t . The parameters β_{1is} and β_{2is} are the annual trend parameters of species i and contrast s for large-scale and small-scale occupancy, respectively, and η_{1its} and η_{2its} are deviations around the trend of species i , year t and contrast s for large-scale and small-scale occupancy, respectively. In addition, we assumed the species-level parameters were drawn from a normal distribution for the 96 species observed in the community (Kéry and Royle 2009, Zipkin et al. 2009). We defined the community-level random effects according to:

$$\begin{aligned} b_{0is} &\sim Normal(\mu_{b_{0s}}, \tau_{b_{0s}}), \\ d_{0is} &\sim Normal(\mu_{d_{0s}}, \tau_{d_{0s}}), \\ a_{0it} &\sim Normal(\mu_{a_{0t}}, \tau_{a_{0t}}), \\ \beta_{1is} &\sim Normal(\mu_{\beta_{1s}}, \tau_{\beta_{1s}}), \\ \beta_{2is} &\sim Normal(\mu_{\beta_{2s}}, \tau_{\beta_{2s}}), \\ \eta_{1its} &\sim Normal(0, \tau_{\eta_{1ts}}), \end{aligned}$$

and

$$\eta_{2its} \sim Normal(0, \tau_{\eta_{2ts}}),$$

where μ_{ω_s} is the mean and τ_{ω_s} is the precision ($1/\sigma^2$) among species for contrast s , μ_{ω_t} is the mean and τ_{ω_t} is the variance among species for year t and parameter ω , and the means for random effects $\eta_{1_{its}}$ and $\eta_{2_{its}}$ are 0 for year t and contrast s .

We estimated model parameters using Markov Chain Monte Carlo (MCMC) simulation implemented in JAGS 4.2.0 (Plummer 2003;2015) using the package R2jags in the R statistical computing environment (R Core Team 2017). We used vague prior distributions for all estimated parameters:

$$\begin{aligned} p_t, \theta_s, \psi_s &\sim Uniform(0,1), \\ \mu_{a_{0t}} &= \log_e(p_t) - \log_e(1-p_t), \\ \mu_{d_{0s}} &= \log_e(\theta_s) - \log_e(1-\theta_s), \\ \mu_{b_{0s}} &= \log_e(\psi_s) - \log_e(1-\psi_s), \\ \mu_{\beta_{1s}}, \mu_{\beta_{2s}} &\sim Normal(0,0.001), \end{aligned}$$

and

$$\tau_{b_{0s}}, \tau_{d_{0s}}, \tau_{a_{0t}}, \tau_{\beta_{1s}}, \tau_{\beta_{2s}}, \tau_{\eta_{1ts}}, \tau_{\eta_{2ts}} \sim Gamma(0.1,0.1).$$

We obtained 25,000 MCMC samples, specified a burn-in period of 12,500 iterations, and used $\hat{R} < 1.1$ as an indication of model convergence (Gelman and Rubin 1992). We estimated the parameters using the mean and standard deviation of the MCMC samples of the posterior distributions, and calculated 95% credible intervals for the beta coefficients (β) for the trends in site occupancy using the quantiles of the posterior distributions.